COMPUTER WEEKLY

Our picture shows Philips' 7000 terminal system that is leading its bid for a share of the electronic office market.

The 7000's communications facilities are oriented towards use as an IBM data entry facility. Up to 32 screens of these different types can be used on one system, with card overlays on function keys for word processors. Remote terminals can be operated over modem links.

Storage Tech 'jilts' Amdahl for micros

AMDAHL has been left at the altar for a second time, on this occasion by Storage Technology, which broke off the engagement to merge following unacceptable conditions from Amdahl's biggest shareholder, Fujitsu of Japan.

It is understood that the sticking point was Storage Tech's ambitions to enter the microelectronics manufacturing business. Amdahl has a nine year agreement with Fujitsu for the supply of semiconductor components and sub-assemblies worth $70 million a year to the Japanese company at present.

It appears that Fujitsu wanted this commitment underlined in the merger agreement, with a further clause that, if the proposed Amdahl-Storage Tech company decided to manufacture for itself chips and sub-assemblies presently supplied by Fujitsu, the Japanese company would be free to offer its own alternatives to the large-scale Amdahl processors in the US.

The Fujitsu machines use Amdahl patents and technology. This was an unacceptable condition to Storage Tech, who scrapped the merger.

A Storage Tech spokesman in Colorado expressed regret at the failure and said the company was still prepared to reopen talks.

Storage Technology bought a microelectronic design house, Micro Technology in March last year, and subsequently announced that it was building a large semiconductor plant in Boulder, Colorado.

Fujitsu has about 26% of Amdahl with options to take it up to about 34%. Having failed in its attempt to take over Memorex last autumn (CW, November 22, 1979), Amdahl has run out of major potential peripheral independent partners in the US.

Meanwhile, to strengthen its position in the IBM compatible peripherals business, Storage Tech has announced its alternative to the IBM 3880, the controller for the high capacity 3380 disc drive announced by IBM a few weeks ago (CW, June 19).

Called the 8880, the Storage Tech unit can have either two or four storage directors while the 3380 is limited to two. The 8880 can handle data rates of up to 4.5 megabytes per second and is designed to support Storage Tech's own alternative to the 3380 which should be introduced early next year. The 8880 can also support strings of IBM 3350 drives and Storage Tech's own equivalent units.

Share issue to help with Magnuson's Euro plans

IBM compatible processor manufacturer, Magnuson Systems, has raised over $20 million in a public issue of 1.1 million shares in the US. According to Magnuson president Joe Hitt, one of the main uses of the money will be the expansion of the company's European marketing activities.

Magnuson has also responded to IBM's announcement of the 4331 Group 2 (CW, June 12) with a new model in its M80 range, that offers 20% more power than the new IBM machine. The M80/31 can be upgraded to any other Magnuson machine including the top end M80/43 which is Magnuson's alternative to the IBM 3031.

The M80/31 can support MVS as well as DOS/VSE and can also run DOS and DOS/VS — neither of which is supported by IBM on the 4300 series.

The maximum main memory size on the M80/31 is 8 megabytes compared with the 4 megabyte limit on the 4331 Group 2.

Hitt told Computer Weekly that the share issue had all been taken up by new investors, half of them financial institutions and the rest individuals. He said that the issue had reduced the proportion of Magnuson owned by Fairchild to 22%. It used to be about 30%.

Hitt would not be specific about his plans for Magnuson in Europe.

Clash over procurement

SENIOR executives from ICL and IBM will be crossing swords in the Parliamentary Computer Forum's debate on government computer procurement policy on July 14 at the Houses of Parliament.

Reay Atkinson from the Department of Industry will give the keynote speech, and there will also be representatives from nationalised industry and local government.

Sole distributors

SOLE distributor for Boole and Babbage software products throughout Europe is now the European Software Co. This follows a gradual takeover of products by BSC from CPF.

Philips' bid for share of electronic office market

PHILIPS is starting its attack on the electronic office market with the unveiling of a terminal system with which it aims to get 10% of the distributed data processing market by 1983. The system, called 7000, is made by Four Phase of California but now has a Philips label and new electronic office software.

Philips took over the marketing of the Four Phase equipment in the UK last year (CW, July 26, 1979) and is now supplying the 7000 throughout Europe under its own name.

The "Fore-word" word processing package has been renamed "Editor" and is being offered along with data entry, transaction processing and programmer work station software, about half of which has been developed by Philips in Europe.

An electronic mail package, still experimental, is now available, providing a means of sending intra-office memos and broadcast messages between "electronic mailboxes". At Philips' office in Maidenhead, Berks, all systems engineers have terminals on their desks by which they can send and receive messages and even be interrupted in other work for urgent announcements. A rudimentary diary facility is also available.

16-bit chip boost for P800 mini range

A 16-bit microprocessor has arrived from the Philips majority-owned Signetics Corp of Sunnyvale, California, and it forms the basis of a new generation of minicomputers in the Philips P800 family.

The chip is called Fast, which stands for Fontenay-aux-Roses (France), where the chip was designed, Appledoorn (Holland) where the layout was done, Sunnyvale where it was implemented and T for technology.

Fast is a bottom end 16-bit micro with the P800 minicomputer instruction set on board, and a second version, Fast 2, is being developed to replace the processors in the larger models of the minicomputer and address up to 16 megabytes of main memory.

The new models in the Philips mini line are the P853 using the Fast 1 and the P854 and 858 using the technology of the existing processors. A P859 using the Fast 2 micro is on the way.

The Fast 1 chip is also being offered integrated into a board computer, the SBC 800, but Signetics was not able to say whether the chip is to be offered as a product.

Over the new generation of 16-bit microprocessors — like the Intel 8086, Zilog Z8000 and Motorola 68000 — it is backed by mature software.

£2 million turnkey system is collared

MERSEYSIDE Police has awarded a £2 million turnkey contract for a command and control computer system to Software Sciences which has an office in nearby Macclesfield, Cheshire. The system will help operations room staff despatch the most appropriate resources to emergency incidents and maintain incident histories with status information from mobile radio code transmitters being input to the system automatically.

Message switching will be [illegible] video ter-minals at headquarters and in divisional offices, as well as printers and the Police National Computer, building up to an expected 1988 traffic level of 25,000 message pairs per hour.

The system will run on Burroughs processors, as does the Police National Computer. Which model has yet to be confirmed, but Burroughs database management system DMS II will be used running under the MCP operating system. Programs are to be written in Algol and Cobol. [illegible]

NEWS IN BRIEF

Logabax wins in OEM bid

DATA Recording Instrument the UK has lost out to the French manufacturer, Loga in its bid for an OEM con from ICL worth an estima £10 million. The contract is matrix printers to be used the new ME 29 system and said that DRI's new line matrix printers, to be launch in about two months time, not be delivered in time.

DRI said that it expected carry on supplying ICL with 180 chps 6320A matrix pri used with the System Te 1500 machines. DRI's printers will run at 240 chps

Escapes the axe

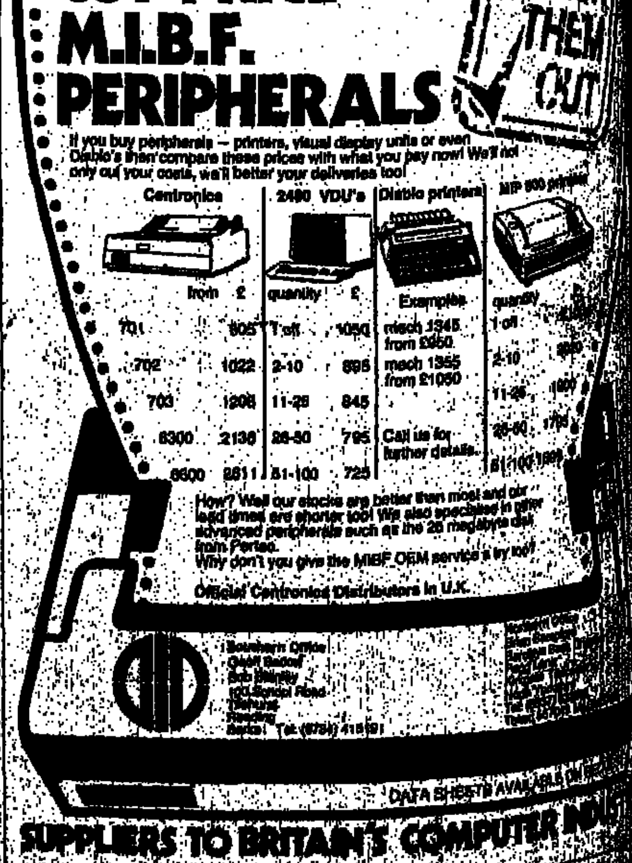
SCICON says that its busines Saudia Arabia has not be affected by Saudi trade res tions on UK firms following controversial film, "Death of Princess." Scicon's main con tract in Saudi Arabia is the million, five-year-old deal to up a comms network, report for the Saudi secret police.

UK office open

DISPLAY terminal manu turer Soroc Technology California has set up a keting office at 103 Cran Road, Ilford, Essex. Direct George Hertz, formerly Data Resources.

Viewdata trials

AFTER over six months' the West German Post has begun viewdata and trials in West Berlin and D dorf. It is planned to have 3,000 users in each city



Printed in Great Britain by [illegible] Limited, [illegible] and published by IPC [illegible] Dorset House, Stamford Street, London [illegible]

COMPUTER WEEKLY
Number 714 Thursday, July 10, 1980 Price 20p

Briefing

IBM cuts UK prices 11%

IBM has cut UK prices on large systems 11% to reflect the hardening of sterling against the dollar (CW, July 3), and it has now announced that users buying their machines abroad will have to pay their local IBM company for installation and warranty, hitherto given free. The charge will depend on configuration, and will not apply where users buy in one of the 18 Western European countries for installation in another.

Tesco is reported to have saved 25 to 30% of the cost of a 3033 by buying it in the US.

Takeover by GEC

AFTER abandoning its joint venture microelectronics company, GEC-Fairchild, General Electric has secured its interests in MOS technology by buying Circuit Technology of New York. The company has agreed in principle to be taken over by GEC for about $7.5 million. The acquisition gives GEC a manufacturing facility for custom-designed CMOS components and a base for the US market.

New Qantel terms

THE acquisition of small business computer manufacturer Qantel by MDS is to go ahead, but on revised terms less favourable to Qantel. The new terms are an exchange of shares valuing Qantel at about $34 million.

Univac £2m orders

UNIVAC has announced orders worth nearly £2 million for its 1100/60 medium scale mainframe from three users of smaller and older Univac machines. Two of the 1100/60s ordered are intended to replace 90/60s, the customers being Weetabix and the London Data Centre, part of the Burton Tailoring group. The third customer, RS Components, is replacing ageing Univac 9480s with two 1100/60s.

Othello contest

A TOURNAMENT for computer programs which play Othello is to be held at University College, Cardiff in July 1981. The emphasis will be on programs for micros, but those for mainframes will not be excluded. Further details from M.D. Atkinson at the Department of Computing Mathematics.

Wordplex to franchise 400 WP bureaux

A NEW attack on the problems of selling word processors to a broader public is being made by Wordplex, which is planning to franchise 400 WP bureaux over the coming year which will also act as agents for selling equipment. The idea is that customers will bring more and more of their typing to a bureau, until they get "hooked" on word processing and decide to buy their own machine.

According to Harry Mallinson, managing director of AES Wordplex, there are an "incredible number" of typing bureaux now in the UK, 95% of which do not yet use word processors.

Mallinson says he does not believe it is possible yet to sell word processors through shops. Customers are not yet knowledgeable enough to be able to walk in off the street and buy. "This way we get the advantage of the bureau operators' entrepreneurial effort."

AES Wordplex in the UK recently split apart the marketing of its two product lines (CW, June 19). According to observers, the parent Canada Development Corp is thinking of separating the two altogether and possibly selling Wordplex, on the grounds that the Corporation has too large a share of the market.

Mallinson pointed out that there is no intention of unifying the two product lines.

Mallinson

Giants compete for PAYE deal

A NEW IBM factory in a development area, expansion of Burroughs' terminal factory in Croydon and a war of words between Univac and Honeywell are among the political ploys in the battle to persuade the government to put the huge Inland Revenue PAYE contract out to open tender. ICL, forced back on to the defensive, has been bombarding MPs with letters stating its case for getting the contract under single tender rules.

IBM is known to be seeking a location somewhere in the EEC for a new General Business Group factory, the product line being unknown at the moment, and one of the lower wage EEC countries — the UK, Eire or Italy — is likely to be selected.

IBM is understood to be putting the word around in political circles that the UK would get the plant if the PAYE contract went IBM's way.

Burroughs held a press conference this week specifically to talk to the press about the PAYE project. One of Burroughs' main arguments is that apart from the central mainframes, nearly all the value of its work on the project would be added in the UK. Its terminal factory in Croydon would be dramatically expanded to provide the 20,000 display stations needed for the online PAYE systems.

Univac, which does no manufacturing here at the moment, said that it would almost certainly build a terminal factory in the UK if it won the PAYE contract. But like Burroughs, Univac would have to import the mainframes and in this respect is at a disadvantage compared with Honeywell, which manufactures large-scale mainframes at Newhouse in Scotland.

A Univac spokesman cast doubt on the future of mainframe manufacturing at the Newhouse plant, suggesting that all big Honeywell processor manufacturing in Europe would soon be concentrated at the CII-Honeywell Bull plant at Angers in France. But Honeywell quickly responded with a statement that it remained totally committed to Newhouse as the UK source for its large-scale systems, adding that the factory was starting to manufacture the DPS 8 mainframes announced this year.

It is far from certain that IBM will be able to build mainframes for the PAYE scheme in the UK, as the company is committed to transferring all mainframe manufacturing to the Continent when the 3033 currently built at Havant is superseded by the forthcoming H-series.

ICL has written to 30 MPs this week, mainly existing or potential allies, listing reasons why they should put pressure on the government to apply the single tender policy.

Micros a threat to women's jobs, says Labour document

A DISCUSSION document expounding the need for greater State intervention to minimise the effects of change brought about by micros, has been approved by the Industry Subcommittee of the Labour Party National Executive Committee.

Party officials are refusing to comment on the document's contents, which are understood to claim that the application of micros to clerical and retail work threatens hundreds of thousands of white collar jobs, particularly those of women.

The report has to be approved by the Home Policy Committee and then by the NEC before it can become party policy, and it may undergo a great deal of change.

The main action proposed by the report to meet the threat of unemployment is a massive education programme to increase awareness of information technology at all levels in society. This would take place in schools, adult education, and the general media.

The free market economy cannot meet the challenge to society of the microchip, the report claims.

● Data protection bid — page 40.

ME29s for German firm

THE ICL ME29, successor to the 2903, has got off to a good start in West Germany, where coal and oil distributor Winschermann has ordered 13 to replace an aged Honeywell batch system.

Based in Dusseldorf, Winschermann wants the ME29 as the basis of an online order entry system, and one machine is going to head office with another in each of 12 depots.

The initial order is worth £1.5 million, but Winschermann has 50 depots in all, each of which will eventually have a computer or terminal.

VAX at St Andrews

TWO Digital Equipment VAX-11/780s have been bought by St Andrews University to replace its ageing IBM 360/44. The two systems, one twice as big as the other, will support up to 36 users and local communications will use Decnet Phase III networking software.

Heart of the business on show

IF you want to be at the heart of the computer industry then you must be at Compec 80 at London's Olympia from November 4 to 6. The biggest show of its kind in the UK, it is now becoming an important international exhibition with many overseas companies taking space.

The major US multinationals are well represented, including IBM, CDC, GE of the US, Digital Equipment, Data General and Burroughs, while Honeywell will have two stands, one from the UK and one from the Italian subsidiary.

Among companies from Europe are Datasaab, Siemens, and French mini maker SEMS. In all there will be about 400 exhibitors and only five or six stand units are now available to enable latecomers to take part in the show.

This year's show will be the biggest ever with the whole of the Grand Hall and gallery being filled. The record attendance of nearly 38,000 last year is expected to be easily passed.

Advance tickets cost £1.50 each and should be ordered from IPC Exhibitions Ltd, 40 Bowling Green Lane, London, EC1R 0NE. Tickets at the door will cost £2.

Threat to NCR from half-price VDUs

NCR users can now buy VDUs identical to the NCR 796-101 and 401 units at under half price if they go to Terminal Display Systems of Blackburn. TDS is the UK distributor for the VDUs built by Applied Digital Data Systems, the US firm that used to supply NCR with OEM VDUs which were sold as the 101 and 401.

The TDS look-alikes for the 101 and 401 are the Regent 25 and Consul 980, respectively, but they were not offered to NCR users while NCR's OEM agreement with Adds was still in force because of what TDS marketing manager, Ian Thornton-Bryar, described as "business courtesy".

But it looks as though NCR users have been missing out on an excellent bargain. The Regent 25 costs £649 compared with £1,445 charged by NCR for the identical 796-101 while NCR users buying a Consul 980 from TDS instead of a 796-401 from NCR can save about £700. TDS charges £1,390 for the 980 while, according to an NCR user, the 401 costs £2,100.

The OEM agreement between NCR and Adds was terminated last year although NCR still has 101 and 401 units in stock, a company spokesman said. The 101 is being superseded by a compatible unit built by NCR itself called the 7900 Model 1 which costs £100 less than the 101 while offering a lot more features. But until the end of the year the 7900 Model 1 is only available to users of V8500 and V8400 mainframes.

INSIDE THIS WEEK'S CW....

BORDER CONFLICT

Conflict over cross-border data flow has been simmering for years with North and South and business and governments [illegible] potential [illegible] conference on the subject [illegible] much more agreement [illegible] Page 15

SERVICES WORLD

[illegible] ternational congress in San Francisco many of the problems and opportunities were discussed. Douglas Eyblom, CSA director general, reports on the meeting. Page 13

DATA ON DISC

Videodisc players are becoming big business in the US and much research has gone into making this versatile medium suitable for the commercial market. In the first of two articles Mike Robson of [illegible] looks at the potential of these new devices. Page 33

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COMPUTER WEEKLY

Vol. 29 No. 714
Thursday, July 10, 1980

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London, SE1 9LU.
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Telegrams/Telex. 25137 BISPRS G

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New York: 205 East 42nd Street
New York NY 10017
Tel (212) 867 2080 Telex 421710

Published weekly on Thursday

Registered at the Post Office as a newspaper. Price per copy 20p

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CIRCULATION INQUIRIES
Requested readership:
01-837 3636
Subscriptions: 0444 59188

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Computer Weekly has a circulation each week of over 90,000 including the highest fully requested circulation in the UK.

Computer Weekly is sent free of charge to the following categories in the UK and [illegible]: Company directors, company secretaries, management service executives, civil servants responsible for computing, management/computer consultants, lecturers and teachers, DP managers/supervisors, systems analysts/O&M officers, programmers [illegible]

[illegible]

ISSN 0010-4787

COMPUTERVIEW

Chips down for Amdahl

FUJITSU'S last-minute move to block the merger between Amdahl and Storage Technology has done Amdahl and the IBM user community at large no service at all. At the same time it has given IBM one of its biggest propaganda coups for years.

For the first time in its 10-year history, Amdahl begins to look like a Japanese company, unable when the chips are down to make any major move without getting the nod from Tokyo. And for Fujitsu, one frequently should read MITI, the ever-present Japanese Ministry of International Trade and Industry.

There is little doubt that the joint Amdahl-Storage Technology company would have been a substantially more powerful force than the two companies can be on their own. And from the point of view of the large-scale IBM user, very definitely a force for good. Amdahl must be credited for many of the concessions IBM has made to users of its top-end machines, most notably the dramatic price reductions that the 303X machines offer the 370/158 and 168.

Analysts now believe that the IBM H-series may after all be air-cooled throughout; if so this will be another victory on behalf of the user, courtesy of Amdahl, which was the first company to demonstrate that water cooling of large general-purpose computers was an expensive anachronism.

By putting the jackboot into the Amdahl-Storage Technology merger, Fujitsu has also made Amdahl look like no more than a Trojan horse for its own ambitions.

At the same time, Storage Technology was arguably over-cautious in rejecting the Fujitsu conditions.

No-one is saying anything concrete, but the understanding is that the sticking points were threefold: Storage Technology wants to develop an in-house semiconductor capability in order to ensure that it is never at the mercy of suppliers in its access to the latest technology; it did not want the merged company to be bound to source a specific proportion of its processor circuitry and sub-assembly requirements from Japan for most of the next decade; and it wanted to be free to enter into manufacture of smaller machines, perhaps under licence from Magnuson, with which it has OEM agreements for processors for its planned back-end database system.

On the first two points, Fujitsu apparently wanted the freedom to enter the US market with large machines in its own right in the event that the merged company implemented the Storage Technology plans.

On the third point, Fujitsu was apparently that the merged company might threaten the its TRW-Fujitsu joint venture to market sma cessors.

Fujitsu would have ended up with about merged company, at which point its ability to future direction would be very limited. If it is Storage Technology took the threat of direct tion from Fujitsu seriously, it seems a pity, since company would have been sufficiently powerful its own in the US market against all comers.

Although Amdahl and Storage Technology able to survive and thrive independently, ambitious for faster growth. Storage Technology to diversify. Amdahl is now most likely to seek small acquisitions like Tran, and to get a injection from a big company seeking to enter technology business, a company in the Gobain, Volkswagen mould.

At which point Fujitsu will have to offer an source of further finance and turn Amdahl overtly Japanese company, or bow to a superior cial force.

From the point of view of users the best would still be an Amdahl-Storage Technology And despite cancellation of the banns, that possibility: Storage Technology is willing to negotiations at any time.

LETTERS to the EDITOR

Infotect's role in today's industry

THE concept of the Infotect strike which was introduced by Tom Gibb (Mythodology, June 19), strikes right at the heart of the problem which has beset many well-intended mechanised information services.

The transfer of an inadequately designed information service to a computer is obviously foolish, but how many services have been rigorously tested before any mechanical aid loomed on the horizon? In the same way as the architect must play an overall co-ordinating role in the design and construction of a functional building, an Infotect must act in a similar capacity in designing and constructing an information service.

I would suggest the nearest we are getting to training Infotects at the moment is the provision of information science courses which maintain a balance between the basic disciplines involved in classification and indexing; storage and retrieval; manipulation and usage — of information. In addition throughout the course there must be an overlay of the application of mechanisation to all these activities.

Who are the instant Infotects that we need right now? They are established practitioners in information services who can marry their information-gathering and dissemination expertise with clear understanding of the nuts and bolts of these dotted around today's industry and commerce.

MICHAEL HAINES
Manager, Systems Development
Employment Conditions Abroad Ltd,
London.

Time to widen use of database

DATABASE is usually considered a technique for central management of large amounts of data on large companies' mainframe machines. Yet a recent EEC survey found no fewer than five DBMS packages available for minicomputers within this country. In addition, shared data computers have become available, and the user who forms part of a larger organisation also has the option of participating in a distributed database.

Taken together, these innovations open database to a new generation of computer users. We at NCC believe that the time is ripe for looking into the choices available and producing some guidelines for both new and established users that have a requirement for database in such environments.

I would be very glad to hear from anyone who has experience of database, either on a small machine or in a distributed system. Any information from users or database specialists or vendors would be appreciated. I would like to hear about their experience; also any advice on the requirements for, or content of eventual guidelines would be most useful.

R. A. ELBRA
Senior Consultant
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THE EDITOR welcomes letters commenting on subjects published in Computer Weekly, or on general topics. All letters must be accompanied by the writer's name and address, not necessarily for publication.

Barriers facing the black S. Africans

I DO not think that M.V.E. Moore's experience during his visit to Johannesburg invalidates the main points made in Allan Cook's letter (Letters, June 12 and June 26). He reports how he saw the excellent training and good jobs being given to black people in South Africa. This is undoubtedly true — for a small number — yet no-one can truthfully say that the opportunities are comparable for blacks and whites in that country. Basically there are very few good schools for black South African children, and so it is not possible for more than a small number of school-leavers to apply for the sort of computing and other jobs that Mr Moore says are fully open to blacks.

The apartheid system discriminates heavily against blacks, too, in not providing the sort of technical training that is appropriate for modern industries. The universities for blacks provide very traditional science and arts courses, with little emphasis on the needs of today's industries.

At one black university where I taught four years ago there was no engineering, no computer science degree course, and no business or management degrees. Students who wanted to pursue these studies had to go to white universities, but from what I heard there were too many obstacles in the way for more than a very few to do this.

Mr Moore, like many British business people who visit South Africa, uses the phrase "within the framework of the law" when he describes how much British companies are doing for their "non-white" workers. This does not, I am afraid, mean that the country is "coming right. We are trying to improve the lot of everyone" as Mr Gray (the subject of the original correspondence) apparently said.

The laws are unjust. White-collar workers here who respond to the government's immigration campaign are taking jobs which should be available to blacks, given adequate educational and training opportunities. And I bet that there are very few (if any) cases where white employees work under a black manager. This would not be within the framework of the law.

Finally I would say to Mr Moore, and any other expatriates who work out there and apparently see nothing wrong with the system — how many black people did you visit at home, or have to visit you? If there were any, you will have encountered some of the mous difficulties involved trying to make genuine based friendships with a different race in South

It is because most people do not make genuine and friendly that they do not learn people in South Africa apartheid. Either that or know, but do not care.

MIKE G

39 Hamilton Road
Reading RG1 5RB.

1984 and all that...

THIS week's example of the strange things people say in the media about computers was sent in by W. M. Gordon of Edinburgh who wins £5.

KEY TO DISC OPERATOR, £3,000 plus, established Leith-based organisation, required immediately, [illegible] machine, loyalty bonuses paid, urgent.

Classified advertisement in the Edinburgh Evening News

Multics ousts ICL, Prime at Brunel

A HONEYWELL Multics system, only the second in the UK, has been installed at Brunel University, replacing an ICL 1903A and a Prime 400. The Level 68 DPS-2 dual processor will support 80 terminals initially, and 120 after upgrading.

The previous Multics is also at a university, Bristol, where it serves Bath as well (CW, June 22, 1978). The Brunel contract is worth over £1 million, and is for traditional Multics kit and not the new low-cost single-processor unit that has been announced in the US (CW, June 12).

Multics was originally developed at the Massachusetts Institute of Technology and came to Honeywell via GE. It is best known for its highly secure design, implemented in rings mainly of hardware which keep users isolated from each other.

Charles Ritchie, director of Brunel's Computer Unit, describes Multics as "the best operating system we know for universities."

A few organisations outside the academic world have also ordered Multics recently. In France there have been orders from INRIA (the national computer research institute) and CERT-ONERA (the aerospace research office in Toulouse). The universities of Grenoble and Rennes are also taking Multics.

Competing with Honeywell for the Brunel order were Digital Equipment, Control Data, and Prime. Prime's multi-mini configurations have been displacing mainframes at a large number of universities and polytechnics.

Amdahl presses on with SNA rival after merger talks fail

DESPITE the failure of the merger with Storage Technology, (CW, July 3) Amdahl's long-term aim is still to offer customers data communication and storage products as well as large IBM-compatible mainframes including an alternative for SNA.

An Amdahl spokesman in Sunnyvale, California, said "Because of the talks with Storage Technology, our acquisition of Tran Telecommunications has been on the back burner. We are now going ahead with that at full speed."

Tran manufactures a multiprotocol communications system with a Computer Automation mini as the master controller.

"Our plan is to enable users to interconnect several computers and many terminals in large networks so that any terminal can talk to any computer. We plan to offer an alternative to IBM's systems network architecture rather than simply a version of it," he added.

Amdahl has also been looking around for a front-end processor and has been considering the Fujitsu 2806, which is compatible with IBM's 3705.

"It is one of the options we are considering, but Fujitsu is not the only company making that kind of processor, and another option would be to do it ourselves," said the spokesman. He did not think a reopening of negotiations with Storage Technology likely.

"We do not plan any moves, but who knows, they might come back," he said.

Apple seeks copyright injunction against ITT

APPLE Computer is to ask the High Court next week for an injunction restraining ITT Consumer Products (UK) from allegedly infringing its copyright.

Apple told Computer Weekly the allegations covered the book "DOS version 3.2", circuit diagrams and layout drawings relating to the Apple disc II system, and computer programs incorporated in or for use in the Apple disc II system.

Apple also wants ITT to deliver up or destroy on oath all infringing material in its possession, custody or control.

ITT Consumer Products has marketed a European version of the Apple II, called the ITT 2020 for two years under contract with Apple. Boards are purchased from Apple and assembled and modified to European specifications by ITT.

Steve Jobs, vice-chairman of Apple, said that ITT is not permitted to manufacture Apple II boards, but if it did, the issue would go to court. Apple has not extended the contract to include its latest business oriented Apple III and neither has ITT ordered any more Apple II boards.

ITT Consumer Products said the matter was complex and was being dealt with by its legal department.

ICL France is now No 1 subsidiary of UK parent

SUGGESTING that there may still be something left of the entente cordiale between the UK and France, Midhat Gazalé, European vice-president and head of ICL France says the French company has pulled ahead of ICL South Africa and is now undisputed No 1 foreign subsidiary of ICL with turnover, including Dataskil and education services, of 485 million francs (£50 million). He told French weekly Ordinateurs, the growth rate is on a par with that of the company as a whole.

Gazalé is delighted, from the point of view of ICL France, that Mrs Thatcher has "prohibited any preferential purchasing policy by public and para-public bodies. I intend to attack the French public sector market vigorously."

The French government has stated that it will abide by the EEC/Gatt rules which, from next year, prohibit preferential purchasing of computers (CW, July 3). ICL France has as broad a product line as either of its major European competitors, CII-Honeywell Bull and Siemens. It employs 1,000 people, giving it a turnover per employee of £50,000.

Police enhance data network

CLEVELAND Constabulary is planning to enhance its three-year-old data network to provide a full computer aided despatch service. More terminals are to be added and new facilities will enable operators to check a caller's phone number, identify which area he is in and locate the nearest appropriate patrol to send in.

At present the system only allows mobile units to be logged in.

Software for the new system is being developed by IAL and tenders are to be invited for the supply of about 30 modem boards. Installation and testing of the system should begin in September and full operation one year later.

DP Olympics finals in Birmingham

THE finals of Computastars 80, the computer world's own sports event, will be held at the Alexander Stadium, Birmingham on Saturday, September 13.

Starting at 10am, there will be a full day's events with 28 men's teams and 20 women's teams competing. Giving the meeting an international flavour will be a contingent of 12 teams from Holland, where Computastars has been sponsored by the Dutch computer publication, Computable.

There will be a licensed bar and refreshments throughout the day, but supporters are advised that covered accommodation is limited. However seats can be reserved for teams and spectators on a first-come, first-served basis.

How to get there: The Alexander Stadium is off the Walsall Road, Perry Barr, Birmingham and is about ¾-mile from Junction 7 on the M6 motorway.

Tickets, £1.00 for adults and 60p for children, can be obtained from the organiser, Gordon Cairns, Computastars Ltd., 117B High Street, Croydon CR0 1QG.

IBM expected to introduce super 4341 later this year

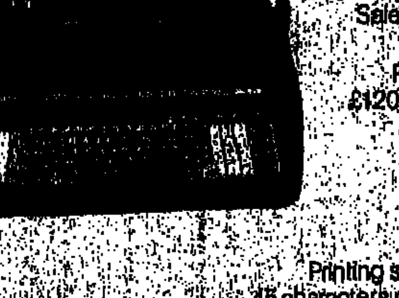
A 4341 Model Group 2 is expected from IBM towards the end of the year, and US industry sources say that it is likely to support MVS as well as DOS/VSE, VM/370 and OS/VS1. MVS support at the top end of the 4300 series is regarded as certain in the medium term, but if it were introduced on the 4341-2 from day one, the new machine would be more attractive to users than the 3031, confirming the original impression that the 303X line was a stop-gap rather than a long-term product (CW, October 13, 1977).

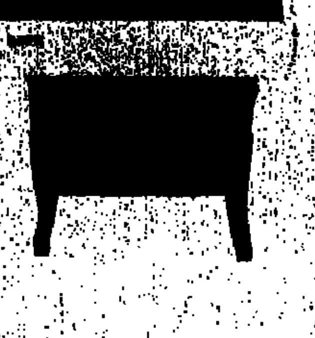
The 3032 has been supplanted by the 3033-N, and IBM has also announced that the 370/158 and 168 will drop out of the catalogue on September 15, and that upgrades for these machines will be provided as available thereafter. Used 158s are very cheap at the moment, and are attractive for users who have the space, because the machine is air-cooled.

The 4341-2, formerly dubbed the 4351, is expected, as the revised number implies, to be a field-upgrade from the 4341, offering performance comparable with the 3031. The reason for the convoluted numbering system is apparently to avoid the need to ballot the mass of orders which always flow in from day one of the announcement of a new product at IBM to decide the delivery sequence.

Two Pi shuts Anaheim centre

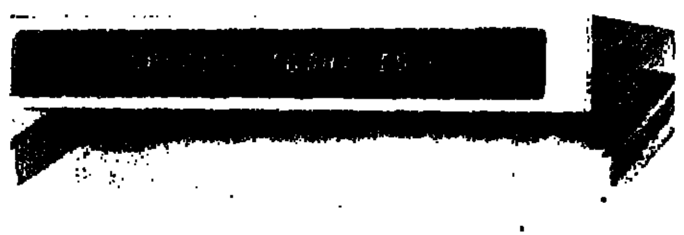
PLUG-COMPATIBLE processor manufacturer Two Pi of Santa Clara, California, has closed its research and development establishment at Anaheim, and sold the laboratory equipment to another Philips-owned company, Magnavox. Two Pi is now making its low-end 370-compatible V32 processors at a rate of three a week and still has almost 80% of its Santa Clara plant in which to expand.





Downtime

by Chad



PICsilating pictograph

I BET you think the object in my picture is an electric sign. Well, that's where you are wrong — it is a Point of Information Computer. So now you know. It is made by Friends Amis of (where else) Los Angeles, is about nine inches long and has a keyboard underneath on which you type in a message of up to 250 characters. This then goes round and round on the display.

Buy a whole set (for only £80 each wholesale) and you can have your own miniature Leicester Square in your sitting room.

Alternatively, just one on your desk would be a useful guide to your colleagues as to your mood each day. According to whether it said "Have a nice day!" or "Bugger off," they would know how to treat you. You need a more complicated model to be able to operate it remotely, outside your office door, like the headmaster at my old school who had an electric sign that said "Engaged." Why he wanted us to think his office was a lavatory I can't imagine.

If your ego stretches to more than nine inches and you would prefer a British product, you can buy a sign three feet long from Newscanner. This stops and starts, flashes on and off, and makes beeping noises, enough to satisfy the most demanding exhibitionist. It costs an order of magnitude more than the little one, but what's a few quid if it helps human beings communicate with each other?

Grub-zapping

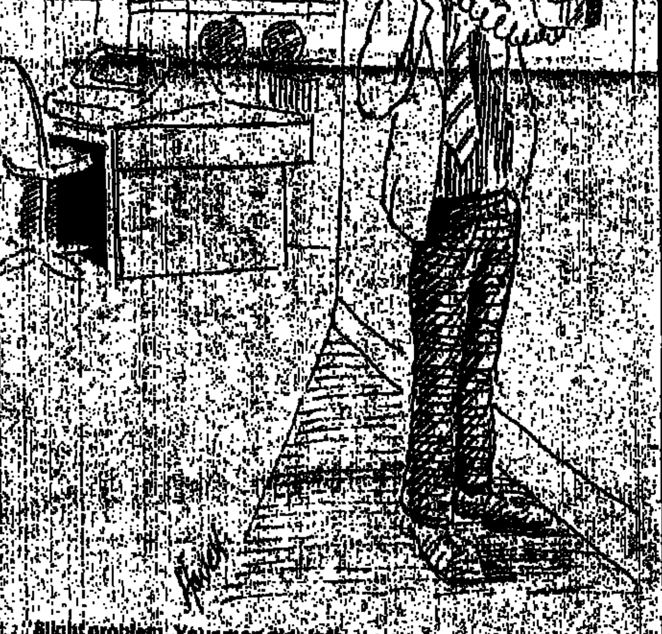
A PETITION is being got up at our local food shop to persuade the dairy to change back to the old traditional cardboard milk cartons (tall and rectangular with wings that make a spout) from the new upstarts (long and rectangular and you have to cut the corner off). I agree with the complaint that the milk spills all over the table, but worse than that, I am convinced that the new cartons make the milk taste funny.

Now don't scoff. There are people who seriously claim that leaving blunt razor blades under a cardboard model of the Great Pyramid of Cheops overnight will magically make them sharp again. So why shouldn't the shape of the cardboard affect the taste of the milk? Someone will have to organise a "blindfold" test for me to establish this scientifically.

Anyway, what is really worrying me are these sinister bar codes that are appearing on my food. I bought a piece of fruit cake the other day that looked like an escapee from Alcatraz. How are they going to get the bars on apples and oranges, tell me that? Am I going to have striped teeth after biting into my Granny Smith? Then I suppose I will have to clean them with striped toothpaste.

In any case, I am convinced there is no way these nasty things will not affect what little taste there is left in our wonderful space-age food.

Then what about these lasers that read the blasted bars? My fruit cake had a transparent wrapping. I don't want my food zapped by some noxious ray, which seems to have the supernatural property of being able to decipher the bars no matter how you wave them at it. Black magic, that's what it is. And I am sure it makes the food carcinogenic. It will all be much simpler in the year 2000 when all we eat is pills.



Slight problem. Youngman didn't fix the exchangeable disc. He exchanged the fixed one.

MICHIE'S PRIVATEVIEW

Rich in know-how but poor in knowledge

ONE consequence of the attempt to computerise mental skills has been to teach us something about how these skills are represented inside the head. A distinction, not widely appreciated, exists between heuristic (rule-based) and descriptive (causal and relational) models, corresponding roughly to the distinction between know-how and knowledge.

In many practical domains it is possible to get by, sometimes with flying colours, on heuristic models alone. A bicyclist ignorant of mechanics, a gardener ignorant of botany, a cook ignorant of chemistry, a politician ignorant of sociology, a cabinet-maker ignorant of geometry, a weather forecaster ignorant of fluid dynamics — all these are cases in point.

Another case is the ability to do arithmetic, which most Computer Weekly readers probably brought to concert pitch for one or another school examination in their early teens. But how many of us have any deep knowledge of arithmetic, any organised theory from which, at least in principle, the reasons why these tricks actually work can be derived? How many could write out Peano's axioms, or trot out and prove any major theorems of arithmetic at all?

So rich in know-how, so poor in knowledge! How is it that our species is this way? Our ancestors were even more so, all art and no science. Experience with practical tasks of knowledge-based programming indicates that reasons lie in the economics of information processing:

1. Knowledge is a mountain of elaborately worked gold: know-how is a handful of nuggets. If your time and money is measured in nuggets, then no more need be said.

2. As earlier noted, heuristics alone will usually take you most of the way. The benefit of a deep theory to a bicyclist, or even to a doctor or an architect, tends to be marginal.

Almost every expert system built so far consists of a handful of know-how rules and little more. In the present state of the art the cost and difficulty of adding a causal model to the heuristic one, and of implementing intelligent communication between the two, is high — too high for all but those applications (such as office automation or robotics) where the need to model causality cannot in the end be dodged.

In order to emphasise how vast can be the causal model corresponding to even the tiny packet of rules sufficient for a simple heuristic purpose, a recent Privateview (CW, February 21) cited the trivial skill of knowing when to open your umbrella. In this nursery example the benefits anticipated from such a model, in terms of added capability for "deep" explanation of system decisions, might not be altogether welcome. Most of us have in our acquaintance some over-intellectualised person whose readiness to dive back in great detail into first principles is viewed as a mixed blessing by his friends.

To such a one, you say "Why?" at your peril. I foresee ramifying sessions with the ultra-intelligent umbrella-opener:

MACHINE: Please indicate state of affairs.

USER: Outdoors. User soaked. Umbrella closed. Weather raining.

MACHINE: Advice: "don't open."

USER; why?

MACHINE: Rule 003: if user soaked then "don't open."

USER: Why?

MACHINE: Necessary precondition of "open" is that user is not soaked. If precondition of an action not satisfied, then advice is "don't do it."

USER: Why?

MACHINE: In this case condition is related to goal; some condition implies achievability of a goal by action, then the negation of condition is incorporated in the precondition. The goal of the action "open" is a state in which the user is not soaked. If the user is soaked then the goal is not achievable by the action "open".

USER: Why?

MACHINE: If something soaked then an action achieving state in which it is not soaked only if it is a drying action. "Open" is not a drying action.

USER: Why?

MACHINE: Drying action categories are: blowing, vacuuming, blotting, heating, freezing. "Open" is not in any of these categories.

USER: Why?

And so on, with the machine plunging deeper into the physics of evaporation, capillary action and the rest.

Endless, thorough patience for the endless repetition of "Why?" What an absolutely splendid interactive companion such a system would make for certain small children!

FOCUS on Room at the Top

THE place of senior company management, at least as far as the DP team is concerned, is as far away from the installation as possible. Even DP management prefers its management to be at considerable arm's length away from the scene of action.

DPMs long ago gave up trying to educate their colleagues outside the computer section. Line management as a general rule limits its appreciation of computing to input and output. Senior management would be hard pressed to operate a desktop calculator.

Compared to senior management, the role of DP management offers an abundance of variety. Management responsibilities include budgeting, personnel, industrial relations, technical appreciation, liaison and a determination to cope with day-to-day crises and longer term strategies. Given such basic facts of corporate DP life, it is difficult to understand the attention given to the future promotion and role of the DPM.

The "role" saga was recently given another airing by Ron Yearsley of BIS, speaking to the IDPM Central London Branch. The winds of change, he stated, were gusting through the corridors of power. The power in question was now within the grasp of the DPM who could pull himself out of the shades of DP into the corporate limelight.

However, advice (as ever) was a little short on how DP management should go about achieving the transformation from processing data to that of processing corporate goals, policies and challenges.

Job satisfaction counts a lot in life and this arrives very much unbundled for the DP team. Having seen the installation enhanced from a basic file/sort punch card system to an advanced level datacom configuration in a remarkably short space of time, the DP team is fully aware of challenges and targets. Should these on-site challenges abate, then there is a plentiful supply of alternative targets featured weekly in the back pages of Computer Weekly.

Such alternative career paths would not meet the approval of those advocating corporate goals, especially as few opportunities are lost to inform all involved that the role of the DPM is on the slide. Increasingly, it is suggested, mainframe suppliers are bypassing the DPM and zoning directly into the boardroom.

Boardrooms, Ron Yearsley warned, have ways and means of dealing with wayward DPMs, especially those turning PCM or to other manufacturers, and are backed up to the hilt and beyond by the strong arms of the company-appointed consultancy teams.

Getting out of the DP rut will not be easy. Being practical individuals, DPMs will probably decide to stay put.

TEN YEARS AGO...

From Computer Weekly of July 9

FOLLOWING hard on the heels of last week's announcement of its 370 range, IBM won a £25 million order from Leasco. The order was believed to be the largest ever placed in the UK. ... Former Mintech minister Tony Benn urged the incoming Tory government to save the work done by Sub-committee D during the debate on the Queen's Speech. ... flight paths and landing runs of airliners landing at London's Heathrow Airport were to be automatically recorded by an Elliott Automation system.

Univac's distributed processing bid

A COMPREHENSIVE range of low cost distributed processing systems with substantial local processing has been announced by Univac. Called the UTS 4000 family, it consists of a 16-bit UTS 4000 family, it consists of a 16-bit controller, the 4020, a UTS 10 teletype-compatible display, UTS 20 editing terminal and a UTS 40 programmable display station.

It is understood the three displays are driven by the Zilog Z80A microprocessor and the cluster controller by an AMD 2901A bit-slice minicomputer. It is similar to the processor used in the UDS 2000 data entry system, which uses a bit-slice emulation of an older Univac mini, the 3760 communications controller (CW, May 25, 1978).

The controller, with up to 256K-bytes of main memory and integral 1-megabyte floppy disc drive, can support up to 12 UTS 20s, and up to 16 peripherals; those available include an 80 chps matrix printer, a 45 chps daisy wheel printer, a 1-megabyte floppy drive and a magnetic stripe reader.

An unusual feature of the series is the use of ROM plug-in program cartridges for things like screen bypass on the UTS 20. Univac says that more features will be added by means of new cartridges over the next two or three years.

Cobol is compiled on a host processor, which can be a 90 series machine, an 1100 or a System 80. It generates macrocode which is interpreted in either the 4020 or the UTS 40.

Our picture shows Univac's UTS 4020 cluster controller from its UTS 4000 family. This model can support up to 12 UTS work stations. Some of the software is held on plug-in ROM cartridges and Cobol programs are compiled on a host processor which can be a 90 series machine, an 1100 or a System 80.

Generator eases use of Cobol

SOFTWARE offered with the 4020 and running under its system control program includes an interactive program generator and an edit processor. The generator is designed to enable easy generation of Cobol screen format programs by inexperienced users. The edit processor provides line-handling functions for data and source code files on floppy disc, enabling users to develop programs offline rather than remotely on the host.

Overall the UTS 4000 offers to users similar facilities to those on the IBM 5280 terminal system announced earlier (CW, January 17).

The UTS 10 is purchase only and costs £945; the UTS 20 costs £1,920, the UTS 40 costs £2,509 and a UTS 4020 with six work stations 5 megabytes on floppy and two printers costs £20,635. Lease terms on all but the UTS 10 are available. Quantity discounts are offered on 50 or more UTS 10s and 25 or more of the other items.

Govt caned over jobs information

THE nationwide shortage of computer staff is being seriously aggravated by the failure of government and industry to keep local education authorities informed of what the country needs. That is the view of Michael Harrison, chief education officer of Sheffield, who said: "Nobody has told me yet there is a national crisis."

Harrison pointed out to a meeting of the UK Consultative Committee for Education and Training in Computing that it was local authorities which actually provided education services but: "We feel excluded from the national information network, if it exists," he said. Education authorities only provided what they were told to, and the government needed to insist politically that schools pursue society's needs.

At the same meeting Alan Daniels of Brunel University expressed serious concern that sandwich courses in computing might have to be cut back drastically if the Manpower Services Commission reduced its allocations in its review later this month. Places in industrial firms for sandwich students were increasingly hard to come by, as companies were reluctant to fund them, and support must then come from the Commission, Daniels said. Sandwich students had the advantage of practical experience when they reached the labour market.

Harrison also complained that state money from the commission was being siphoned off to commercial computer schools at a time when his polytechnics could not get money for computers. He was referring to the commission's plan to offer, from September, funding for the 18-week classroom part of its Basic programming course, to be run either by colleges or commercial computer schools. The course is intended to have another 24 weeks of on-the-job experience which the commission will not fund.

Consultative committee chairman, Professor R. A. Buckingham pointed to the slow increase in the number of qualifications in computing awarded by the non-university sector, and said this was "not encouraging".

From 1968 to 1973 there were 9,150 awards and from 1974 to 1979, only 14,400. This was due to lack of teachers, physical facilities, and adequate support for students, particularly support from employers.

Joseph plays hard to get over second Inmos grant

THE government will take a lot of persuading before it gives the second £25 million to Inmos International, the micro development and manufacturing venture set up with funds from the National Enterprise Board.

This was made clear by Industry Minister Sir Keith Joseph in a Commons debate last week on an Opposition motion calling for the money to be paid without delay. There would be no decision for two or three weeks until the NEB had completed its review of the project, said Sir Keith.

It would be an illusion, to imagine that the second payment to Inmos would involve only another £25 million of taxpayers' money. The probable risk would be well over the £50 million originally projected because Inmos planned to spend money it intended to borrow on top of the £50 million. If the project was totally unsuccessful and the company could not sell its products on the world market far more than £50 million of taxpayers' money might be written off, he added.

A further factor in the delay, he claimed, was the surprise caused by Inmos' decision to locate the first production project at Bristol, which had come at a time when the governemnt's instinct was to see that such a project went to an area crying out for new employment.

John Silkin MP, shadow industry spokesman, opening the debate accused Sir Keith of dithering and hesitating over the decision. Delay had already cost a great deal.

"Inmos estimates that delay, in turnover terms — annual turnover is worth £86m — costs £300,000 a day. On that basis, while the Secretary of State has been making up his mind we have forfeited about £36 million worth of turnover. That amounts to a good deal more than the second grant."

Silkin conceded that Inmos was a high risk concern. It had, however, been an even higher risk two years ago and had now begun to bear fruit.

Alan Williams MP (Lab. W. Swansea), said the capacity of the micro chip doubled in the space of each year. The commercial implications were clear. If a company did not act quickly, its product was obsolete.

Ian Lloyd MP (Con. Havant), said he accepted the overriding need for economy in public expenditure, but there must be exceptions to every rule. There was no more obvious exception than investment which lay at the heart of recovery of UK industrial performance and output.

The House rejected the Opposition motion by 312 to 251, a government majority of 61. The government's amendment, which welcomed the NEB review, was then approved without a division.

PAGE SIX for programmers and analysts

Splendid news for today's applications programmers

EVERYBODY has been chilled with scare stories of the way in which the microprocessor is going to cut swathes through the ranks of the employed over the next 10 years, cutting down jobs by the score.

The typical Cobol programmer is no exception. Today's programming jobs, we are often told, will disappear in a few years' time as things like automatic software generators take over. Page Six has consistently thought and said differently, and for people looking for job security as programmers and analysts, the recent Intel Fair at the Wembley Conference Centre was enormously encouraging.

What the Fair made quite clear was that within the next 18 months or so the microprocessor will come of age. That is by no means encouraging news for everybody, but it is splendid news for today's application programmers, who make up the backbone of the industry.

The current Intel leading-edge product is the 8086 16-bit micro, designed to be programmed in a high-level language. That sets it apart from the majority of today's minicomputers, which have evolved from architectures which were designed to meet the requirements of assembly language programmers writing small programs. Further, Intel is including in the instruction sets of its forthcoming products instructions which are specific to the requirements of high-level languages — instructions to perform functions such as array bounds check and enter/leave instructions for creating local displays on the stack.

There was a time when a microprocessor was a component and nothing more. Somebody had to write an operating system and a compiler before it was of much use to anybody except for a machine code programmer. And there are plenty of operating systems around — CP/M and versions of Unix and UCSD.

All that is about to change. Where the 8080 was far more important than the RMX-80 operating system, Intel is determined that RMX-86 will be more important than the chip on which it runs.

RMX-86 is not actually anything very much yet. All that is available is a nucleus, a debugger, an asynchronous basic input-output, a terminal handler for a single terminal, and a files utility.

But conceptually, RMX-86 is enormous — and will take up a very significant part of the one-megabyte main memory address capability of the 8086. Begin to see where the micro industry is heading? That's right, straight into the mainstream of today's general purpose computer market. Equally complex, equally demanding, better in some respects because of some new architectural concepts, but overall a tool which will require the self-same skills as are needed by today's commercial programmer.

Intel's most powerful 16-bit product is a device called the iAPX 286 which which will run an enhanced version of the RMX-86 operating system, which looks like Multics in terms of things like rings of protection — only better. It will have four levels: a kernel which will be able to access all other levels, a system services level which will be able to access the outer two, an applications services level (or ring) which can only access the outer ring, which is the applications.

The cheapest Multics processor was recently slashed in price to $600,000, down from over a million. What sort of price does one put on a 16-bit microprocessor chip? Needless to say, the software charges will be substantial, but with low-cost peripherals a system should be close to an order of magnitude less expensive in two or three years' time. But it will be comparable in complexity to Multics — and very nearly as demanding to program.

Samples of the iAPX 286 are over a year away, but an even more mind-blowing device, the iAPX 432, is due to be sampled at the end of this year.

This is where things begin to get really hairy. The iAPX 432 is a two-chip set which, assembled with an interface processor and a front-end iAPX 286 or 8086, becomes a true 32-bit microcomputer offering power comparable with that of the IBM System 38 specification.

The operating system is being designed to run up to 10 processors in parallel (just like the Tandem Nonstop 16 systems), and memory addressing will be four gigabytes. The iAPX 432 will have no assembler: it will be programmed only in a high-level language. The systems implementation language will be a superset of Ada, itself a development of Pascal. Many of the operating system primitives will be instructions, and the architecture marks a complete break with traditional von Neumann architecture, with "objects", which can be anything from data segments of variable length to tables, taking the place of bits and bytes.

A similar architectural approach is taken in the IBM System 38, and people interested in developments in computer architecture should take a look at that machine.

Intel is talking about iAPX 432 samples being available at the end of this year. The software, however, will not be available until the end of next year.

That would be funny if it were not so depressingly reminiscent of users' experience with IBM. And mention of IBM is appropriate. Because by putting many of the operating system primitives into the instruction set, Intel will effectively lock users into Intel operating systems and software just as effectively as IBM users are locked into IBM software.

The languages to be supported on the Intel iAPX 432 are Cobol, Fortran and Pascal, and much as the cognoscenti — certainly those attending the Intel Fair — hate it, Basic will probably turn up at some stage too.

Low-cost hardware will create a stream of demands for new applications, and it is beginning to look as if the occupation of programmer in 10 years' time will have changed very little from that of 10 years ago.

Something to think about: Tom Lehman, an Intel lecturer left his audience with a salutary message:

"The Sears Tower in Chicago — tallest building in the world — took two years to build, and the average construction worker who put it together was considerably less well educated and intelligent than the people who develop computer systems. Yet that building was completed on time, and it works. The lifts go up and down, the loos flush, the air-conditioning works. Why can't we do the same?

"The answer is that they built a plan before they started work. And they stuck to it."

Puzzler

A SYSTEMS engineer rings up central stores to order a length of special cable. Unfortunately the line is bad and the storekeeper transposes feet and inches in writing down the required dimensions.

The interchanged figures still make up a valid imperial measurement, so the mistake goes unnoticed. When the cable is delivered, it turns out to be only 30% as long as it needs to be. What was the original length called for? See page 31 for solution.

SOFTWARE FILE by Claire Gooding

Workstation boost from OS/3 update

DUE in December, Release 7 of Univac's OS/3 operating system features substantial enhancements over Release 6, many of them designed to support interactive transaction processing from a workstation.

Despite the extensions, all the software will run on unmodified 90/25, 90/30 and 90/40 machines as well as the new System 80 (CW, April 10).

The principal enhancements in Release 7 are extensions to the language compilers, the addition of a dialogue processor and screen format generator, consolidation of the file access methods, 14 job partitions instead of seven, and an interactive facility for system generation.

In addition the Escort applications development language, highly regarded as an effective programming tool since its launch with the BC/7 Intel 8080-based office computer, and the Univisa suite of commercial applications packages, also from the BC/7, are featured. BC/7 users can transfer all their Escort and RPG II programs and run them under OS/3 without adaptation or recompilation.

The RPG II compiler has been enhanced over standard IBM System 3 RPG II with extensions for workstation support, online input of data and diagnostics.

The Cobol 74 compiler is still different from the Cobol under OS/1100, but is closer than the old Cobol compiler. There are also enhanced Fortran IV and Basic compilers, each with workstation support added, but all the old OS/3 compilers are also supported.

The new Dialog processor replaces the job control language and co-ordinates dialogues between the new workstations — themselves an innovation under OS/3 — and the system.

Customers can generate their own interfaces to existing programs so as to make them easier to use in the end-user departments. Question and answer routines can be appended to help new operators through the routines, and data and parameter inputs are simplified. For new programs, the Dialog processor can be invoked between the user and the system, so that less Cobol code has to be written.

The screen format generator enables the programmer or end-user to set up their own screen formats, setting validation rules, and once formats are stored, they are made available to any other application.

Consolidation of the file access methods with a centralised data management program provides for a single access method combining the functions of traditional methods for random, sequential and index sequential files. The database management system offered is DMS, a Codasyl database.

The IMS information management system — not to be confused with IBM's IMS database management system — is supported on System 80, and enables programmers to write online transaction programs in RPG II and Cobol in the same way as they write batch programs, since all the transaction features such as input validation, file management, security and the inquiry language are handled by IMS.

Hospital system copied

THE patients record system developed by Plessey for Northwick Park Hospital, Middlesex has been installed at the Middlesex Hospital in London (CW, February 28).

The system allows central information on patients, such as home address or their ward, to be accessible immediately as well as processing large volumes of laboratory data.

The hospital is to use the same hardware as Northwick Park's. It is based on Perkin Elmer 7/32 minicomputers.

Pascal for HP 1000

PASCAL is now offered by Hewlett-Packard for use on the HP1000. The new Pascal/1000 compiler runs in the multi-user environment of the firm's RTE-IVB operating system.

Panvalet interface

A STRUCTURED programming facility interface for Pansophic's library system Panvalet is available. The IBM product SPF provides TSO users with an in-core full-screen program editor. The interface option, which Pansophic claims to be the only such on the market, allows a library user to access programs directly rather than having them copied into a TSO temporary data set.

Unix modified for Univac

THE Unix time sharing operating system developed by Bell Labs and widely used on Digital Equipment PDP-11s has been modified to run on the Univac 1100/60 and will soon be available.

Unix is expected to play a part in the plans for AT&T's advanced communications service. It was also adopted by Zilog for the Z8000 cross software package (CW, April 3).

Very much for their Comfort

HOTEL systems worth £160,000 have been sold by Monotype to Comfort Hotels for guest reservations and accounting in 50- to 160-bed establishments. The equipment is the Monotype 80 word processor, made in the US by Ontel, with special software. Enhancements to the Model 80, including incorporation of the Intel 8085 chip for greater speed, are expected.

Micro Focus scoops deal for its Cobol

MICRO Focus has won another major OEM deal for its transportable version of Cobol for micros, CIS Cobol with BASF, to supply the product for its desk top computers 7100 and 7120.

BASF's diversification from IBM compatible mainframe peripherals into the desk top market (CW, June 28, 1979) was marked by the unveiling of the Z80 based 7100 at the 1979 Hanover Fair, followed by the launch of the 7120 at Info 80 this year.

Until now the systems have been working on Extended Business Basic but, by adopting CIS Cobol, the company is trying to extend the systems' appeal, and has its eye on further implementations, possibly with inclusion of Pascal.

Micro Focus puts down its success partly to the adaptability of CIS Cobol to different hardware at a level which allows interface with existing operating systems such as CP/M and the LSI-11 version launched last year under RT-11.

The company's foothold in the US market was further boosted by obtaining certification from the General Services Administration, which gives CIS Cobol a significant advantage over the other UK contender in the market, CAP's Microbol.

Micro Focus is now turning its attention to providing development aids such as its program generator Forms-2.

CS Cobol sales package

A SALES ledger accounting system written in Data General CS Cobol is now available from the Hounslow based software house, Computerplan. For users who already have Data General CS hardware the package costs £2,500, and licences to OEMs are available at £1,250 for a single-user and £3,500 for a multiple user.

OP SPOT

by Bernard Alle

Management forums in London

INFOTECH Operations still has another three forums to run in its International Operations Management Series for this year.

The first concerns new directions in mainframes and takes place at the Europa Hotel in London on September 16 and 17. It will include speakers from ICL, IBM, Amdahl and CDC.

Next comes a forum on computer crime prevention, which will be chaired by Bernard Tozer, head of Systems Conservation. It takes place at the Mount Royal Hotel in London on October 7 and 8.

The last forum in this year's series is entitled The Operations Factory, and the speakers include David Hebditch, an independent consultant, and Andy Smith of the Bank of Ireland.

It takes place at the Mount Royal Hotel on November 18 and 19.

The fee for each of the forums is £310.

Contracting in Europe—both stimulating and rewarding

LISTEN to Terry Darling for half an hour or so and you'll be sorely tempted to pack your bags, say goodbye to your operations manager and take your operations skills overseas.

A contract operator at a site in West Germany, the articulate Darling certainly makes contracting in Europe seem a very tempting proposition.

Like so many British contractors before him, Darling has found life aboard to be different, stimulating and very rewarding from the financial angle.

Currently at a site in Offenbach, West Germany, he said, "I've been out here on and off for in the past 16 months. I originally came to show the German operators how to run the Honeywell Level 66 system. Now I just cover the holidays and sick leave, and I'm due back in England very soon."

None of the resident operators speak English and Darling isn't fluent in German. In teaching and subsequently working with the operators he has communicated by means of a "sign language", and it's worked very well.

All the site's operations manuals and documentation are written in English, which has made Darling's job all the more straightforward and enjoyable.

"On the old Honeywell OS 2000 everything was written in German, but with the Honeywell Level 66 everything is written in English, and that's been a help."

According to Darling, the operators are encouraged to speak up if they have any ideas on the manner in which the system is run. Their ideas are considered by the software people and acted upon accordingly.

"The operators and software people work together and use a bit of foresight to avoid problems. In the UK it's rather a case of letting things happen and then acting, I'm afraid."

During his stay in their country, Darling has found the Germans to be positive and very friendly in their attitude towards him.

"Of course, I've missed my wife and family terribly. But at the same time I've been befriended by a lot of people over here.

"The people over here are great, as long as you don't start off with the preconceived idea that England is the greatest and everyone else is second-best. It's really a case of when in Rome do as the Romans do."

Typically, he came in for some good-natured teasing when England failed to make any real impact in the European Nations Cup football tournament.

Accommodation has posed no problem for Darling as the company puts him up in an hotel and picks up the bill at the end of each stay.

"I'm in a £10-a-night hotel suite, and it's really quite comfortable with all the usual facilities.

"Renting a place would cost me somewhere in the region of £100 to £180 per week. But buying your own place is very expensive over here — the average terrace house costs between £80,000 and £90,000."

According to Darling, the permanent operations staff at the site earn around £600 a month, with shift leaders getting anything upwards of £800.

That's not too bad if you bear in mind that the cost of living "is only about 5% higher than in England when you take all things into consideration."

During his spare time, Darling likes to look around the German towns, comparing their streets and architecture with that of this country.

"Why do people go abroad?" he went on. "It opens eyes and enables you to see a different culture. Travel really does broaden the mind."

Part of that culture is the restaurants with the "spicy food served with lots of salad", which Darling is ever willing to sample.

"In England you tend to get good and bad restaurants with very little else in between.

"Over here it's a bit different. In between the good and bad you get the moderate bar/restaurant sort of place where you can get quality food at a reasonable price. I've been experimenting with some of the more highly-spiced dishes. I like food, anyway."

Burning all those extra calories has, however, proved to be rather more difficult than eating them, as he doesn't know anyone with whom he can play squash, his favourite sport.

"They do an awful lot of cycling, and tennis and football are very popular. Actually the Germans make very good use of their leisure time — they know how to relax and enjoy themselves.

"It's all part of their attitude to life. When they're at work, they're at work — they start at 7.30 in the morning and adopt a very efficient approach.

"But once they're away from their work it's forgotten. Yes, I'd say they work hard and play hard."

Dutch people are also very friendly and helpful towards the British, as contractors Dave Whitfield and Brian Scott have found out over the past couple of years.

Whitfield, who hails from Heoam in County Durham, is currently on a JCL writing assignment at an installation in the South of Holland.

He said, "It was the money that tempted me out here in the first place, but I've grown to really like the place.

"This is my second contract in Holland, the first was North. I prefer the peopl South, they're much friendly than the North all things considered."

In his 16 months i land, Whitfield has acq "reasonable" knowledg Dutch language, which necessity as most of the documentation he deals written in that language.

Obviously enjoying his Whitfield went on, "Wh finish your day's work i like being on holiday. There's always someth to look at."

The town of Heerlen Dutch/German border can be in yet another country very quickly.

"It's great for travelli many is ten minutes aw gium 25 minutes, and i about four hours to get

Scotsman Brian Scott that he can earn betwe and 40% more by work Holland: "Basically I ca the money but there ar things as well. I think y to have a sense of adve work abroad."

He's currently on a c with Philips in Eind where they are converti a Philips 1400 to an IBM with CMS, DOS and OS VM.

"The conversion is go providing us with ple overtime, and that can't We start work at 7.15 often go on until after evening."

Flat finding can be ha In Holland, but not for Sc he had friends who were living there.

"Most operators spe first few weeks in a ho have to look around for accommodation. We re house in one of the subur It's fine. I pay £100 a inclusive of gas and elect

Since he's been over Scott has taken up a new time — clay pigeon shoot joined a club here and a great sport," he said.

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DEC KD11-R LSI 11/1 CPU with 32Kb RAM	£1350
DEC KDF11-HD LSI-11/23 CPU with 64Kb RAM	£1848
DEC KDF11-HF LSI-11/23 CPU with 128Kb RAM	£2772
DEC KDF11-GD LSI-11/23 CPU with 32Kb RAM	£2156
DEC KDF 11-SG LSI-11/23 CPU with 160 Kb RAM	£3449
PROCESSOR OPTIONS	
DEC KEF11-AA Floating Point Instruction Set	£258
DEC KEV11 Extended and Floating Point Instruction Set	£115
EXPANSION MEMORIES	
DEC MSV11B 4K by 16 bit memory	£395
DEC MRV11-BA PROM/RAM memory includes 512 byte RAM	£199
DEC MSV11-DD 64Kb RAM including on-board refresh	£895
DEC MXV11-AA Multi-function module. Includes 8K byte RAM	£492
DEC MXV11-A2 Bootstrap PROMS	£33
COMMUNICATIONS OPTIONS	
DEC DLV11-F Serial Interface Unit	£160
DEC DLV11-KA RS 423 to 20mA in line converter	£85
DEC DUV11 DA Synchronous Line Interface	£420
DEC DZV11-B Four Line Asynchronous Multiplexer V24	£525
INTERFACE OPTIONS	
DEC AAV11-A 12-bit, D/A Converter	£850
DEC ADV11-A 12-bit, A/D Converter	£895
DEC DCK11-AA Interface Chip Set	£35
DEC KWV11-A Programmable Real-Time Clock	£495
PERIPHERALS	
DEC RLV11-AK 5.2Mb top loading removable cartridge subsystem and controller	£3388
DEC RL01-AK Add on 5.2Mb top loading removable cartridge disc drive	£2495
DEC RXV21-BD Dual drive double density, 1024K-bytes capacity plus DMA LSI-11 interface board	£2556
DEC TU58-BB Dual drive tape cartridge subsystem	£595
DEC PB11-AY Desk-Top Universal PROM PROGRAMMER for connection to systems using RT11. Includes serial interface	£1293
ACCESSORIES AND OPTIONS	
DEC BA11-MF Expander box backplane and power supply	£860
DEC Selection of cables	Price on request
DEC H780-J Power Supply	£450
DEC H9270 Backplane/card guide assembly	£123
DEC H9273-A Nine slot backplane/card guide assembly	£363
DEC H9281-BA Housing assembly for four LSI modules	£67
DEC H9281-BB Housing assembly for eight modules	£104
DEC H9281-BC Housing assembly for twelve modules	£135
DEC H8921-AA 2 x 4 backplane	£50
DEC H8921-AB 2 x 8 backplane	£70
DEC H8921-AC 2 x 12 backplane	£99
DEC REV11-A Refresh/Bootstrap/Diagnostic/Terminator	£175
DEC REV11-C Refresh/Bootstrap/Diagnostic Option	£175
SOFTWARE PACKAGES	
DEC RT-11 Real Time Operating System, for 11/03 processors: QJO13-CQ on DECpack (RL01)	£985
QJO13-CX on Floppy Disc (RX02)	£985
QJO13-CY on Floppy Disc (RX01)	£775
DEC FORTRAN/RT-11, optimizing extended superset of the ANSI standard FORTRAN IV language, running under RT-11: QJ813-CQ on DECpack (RL01)	£431
DEC BASIC-11 running under RT-11: QJ913-CY on Floppy Disc (RX01)	£388
DEC Multi-user BASIC/RT-11: QJ921-CQ on DECpack (RX02)	£425
DEC RSX-11M disc based real-time operating system: QJ738-CQ on DECpack (RL01)	£2494

DEC COMPATIBLE COMPONENTS

INTERFACE OPTION	
COMMA DRV-11 Equivalent	£135
EXPANSION MEMORIES	
CDC Memory Module 16K by 16-bit	£350
PERIPHERALS	
Drico 0.5Mb dual drive including controller (RX01 compatible)	£1550
Drico 1.02 Mb dual drive including controller (RX01 compatible)	£1990
CDC Hawk 10Mb cartridge disc drive (RK05 Software compatible)	£3250
CDC Hawk controller	£840
CDC Phoenix 96Mb cartridge disc drive (RK06 Software compatible	£5250
CDC Phoenix controller for LSI 11	£2800
CABINETS	
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MICRO-COMPUTER SYSTEMS

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DEC PDP 11/03, RX02 (1.02 Mb disc)	£4995
DEC PDP 11/23, RX02 (1.02 Mb disc)	£5995
DEC PDP 11/T03, RL01 (10Mb disc)	£8995
DEC PDP 11/T03, RL02 (20Mb disc)	£10750
DEC PDP 11-23/T03, RL01 (10Mb disc)	£9750
DEC PDP 11/23/T03, RL02 (20Mb disc)	£11500
DEC PDP 11/03, TU58, dual tape cartridge system	£3250

All of the above prices are for original DEC equipment (except for cabinets) and include a minimum of 64Kb memory, floating point arithmetic options, RT11 run-time licence and are eligible for maintenance by DEC.

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Comma Robin 03 (.5Mb RX01 compatible floppy disc system)	£3995
Comma Robin 23 (as above but with DEC11/23 processor)	£4750
Comma Kestrel 03 (1.02Mb RX01 compatible floppy disc system)	£4500
Comma Kestrel 23 (as above but with DEC 11/23 processor)	£5250
Comma Hawk 03 (10Mb RK05 compatible cartridge disc system)	£6950
Comma Hawk 23 (as above with DEC11/23 processor)	£7650
Comma Phoenix 03 (96Mb RK06 compatible SMD system)	£10750
Comma Phoenix 23 (as above with DEC11/23 processor)	£11500

Four serial line interfaces are included in both DEC and DEC compatible micro computer systems and additional original DEC memory can be added at a price of £895 per 64Kb.
Additional DEC compatible memory is available at discounted prices.
Ex-stock delivery is offered on the above DEC and DEC compatible systems with fully supported RT11, RSX 11M for 11-23 based systems and FORTRAN, BASIC, MULTI-USER BASIC and other options to suit specific requirements including Analogue/Digital Conversion, Real Time Clocks, Interfaces a [illegible]

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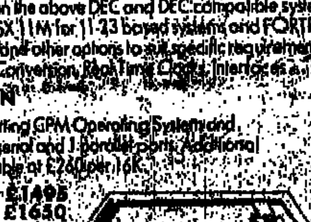
8 bit micro-computer supporting CPM Operating System and comprising 32K memory, 2 serial and 1 parallel ports. Additional memory modules are available at £260 per 16K.

HRZ 1D 180Kb disc drive	£1495
HRZ 2D 360Kb disc drives	£1650
HRZ 2Q 720Kb disc drives	£1995

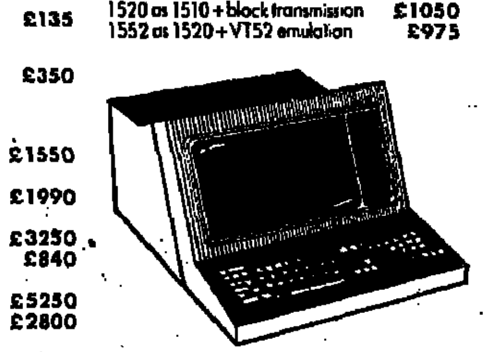


ANCILLARIES

SERVOGOR	
281 Flat Bed Microprocessor Controlled multi colour plotter	£2950
SIGMA	
GOC 5250 Graphics Option Controller – converts most VDUs to full graphics terminals	£1995
MIDLECTRON	
M33 P/T Reader	£495
M62 P/T Reader Punch	£1295
M22 P/T Reader Punch	£895
M42 P/T Reader Punch	£995
ASCII/Telex Cod Conversion	
TRANSDATA	
307 Acoustic Coupler	£210
307A Acoustic Coupler	£185
TECHTRAN	
Dual Cassette Recorder	£1425

VISUAL DISPLAY UNITS

DIGITAL EQUIPMENT CORPORATION	
VT100 80/132 col with det keyboard	£1195
VT132 As above + block trans/edit	£1325
NEWBURY LABORATORIES	
[illegible]	£485
NL7000C As above + cursor addressing	£495
NL7002 As 7000 + num keypad & u/l case	£595
NL7002 (1K) Runs BASIC language	£680
NL7002 (12K) As above with add memory	£760
NL7002C As 7002 with cursor addressing	£645
NL7007 As 7002 with block trans/edit	£745
NL7007 (14K) As 7007 with 7 add pages	£795
NL7009 As 7007 (14K) + project field	£795
NL7009 APL As 7009 with APL char set	£850
NL7009 with VT52 with emulation	£795
NL7009 with ICL7181 emulation	£1150
NL7009 with ICLOLSA emulation	£825
NL7009 with Honeywell VIP 7250 emulation	£850
NL7009 with Honeywell VIP 7001/6 emulation	£1150
HAZELTINE CORPORATION	
1400 Tty compatible + cursor addressing	£550
1410 as 1400 + numeric keypad	£590
1420 as 1410 + highlighting/function keys	£650
1500 as 1420 + upper & lower case	£785
1510 as 1500 + edit facility	£880
1520 as 1510 + block transmission	£1050
1552 as 1520 + VT52 emulation	£975



LEAR SIEGLER	
3A Teletype compatible, XY cursor addressing	£495
3I Tele type compatibility, edit and protected field facilities	£795
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3AG With Retrographics Option	£1395
PERICOM	
6801 Tty compatible det keyboard + edit	£985
6802 as 6801 + function keys	£1085
6803 80/132 cols + block transmission	£1285
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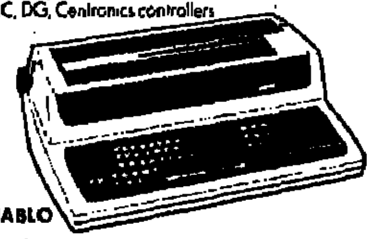
PRINTERS

DIGITAL EQUIPMENT CORPORATION	
LA36 KSR DECwriter II 30cps	£995
[illegible]	£750
LA120 KSR DECwriter III 180cps bi d rect	£1650
[illegible]	£1295
LA34 ASR DECwriter IV with paper tape	£1755
LA38 KSR DECwriter IV as LA34 + options	£895
MANNESMAN TALLY	
[illegible]	£1395
[illegible]	£1375
[illegible]	£1195
T/2200Q quietised 200Lpm line printer	£2582
T/3300 as above with 300 line per min	£2819
T/5000 as above with 500 line per min	£3615

Tally line printers are available with DEC, DG, Centronics controllers



DIABLO	
1650 RO 40cps with metal daisy wheel	£1995
1650 KSR as above with keyboard	£2550
1640 RO 40cps with plastic daisy wheel	£1995
1640 KSR as above with keyboard	£2095
1345 RO 45cps with parallel interface	£1995
TEXAS INSTRUMENTS	
743 RO 30cps thermal printer	£1105
743 KSR as above with keyboard	£995
763 KSR 30cps + bubble memory	£2475
765 KSR as above + int. acoustic coupler	£2195
783 KSR 120cps thermal printer	£2395
745 KSR 30cps + integral acoust/coupler	£1150
OMNI810 RO 150cps matrix printer	£1450
OMNI820 RO as above with X on/off	£1450
OMNI820 KSR as above with keyboard	£1650
OMNI825 RO 75cps matrix printer	£1250
OMNI825 KSR as above with keyboard	£1090
NEWBURY LABORATORIES	
8300 125cps 80col parallel interface	£460
8300R as above + serial interface	£475
8300RM as above + 2K memory	£525
CENTRONICS	
730/2A 100cps 80col parallel interface	£425
730/4 as above + serial interface	£480
730/7 50cps high quality print	£565
LEAR SIEGLER	
310 RO 160cps bi-directional	£1245
301 RO as above + parallel interface	£1275
TELETYPE	
Teletype 43 KSR 30cps pin feed	£695
Teletype 43 KSR 30cps friction feed	£720
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Olivetti TC485 KSR 132col 60cps Special Offer	£1195
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PEOPLE and EVENTS

School-industry project is two-way success

A JOINT project on computers between a school and a manufacturing company has succeeded in helping both the firm and the school.

The boys of Patcham Fawcett School in Sussex made a study of the use of computers in stock control, and of the sociological aspects of the use of computers, by Kearney and Trecker Marwin, which manufactures machine tools. The project helped bring computer studies alive for the boys; but it also forced KTM to rethink its DP procedures and helped it improve its DP training techniques.

The collaboration was brought about by Sandra Landy, of the BCS Sussex branch. A BCS seminar on the project was attended by 70 people from Sussex schools and companies, some of which showed strong interest in starting up their own schemes. Now the Bristol branch of the BCS is planning to start the ball rolling in the West.

Systems Designers Limited, the UK systems consultancy in which the NEB has a minority interest, has a new managing director. He is Errol Bishop, and he takes over from Philip Swinstead who continues as chairman and MD of SDIL, the group holding company.

Peter Childzey has joined Microsystem Services as a product specialist to provide technical support to customers and sales staff. He was previously technical manager with Physio Control (Europe), manufacturers of defibrillators and portable cardiac monitoring equipment.

Frank Bumb, previously president of the data tape division of Bell and Howell, in Pasadena, has been appointed president of Kennedy Company of Monrovia, California. He succeeds Charles Kennedy, the company's founder, who remains as chairman.

Bob Shankland has become manager for South-East England at Computervision. Previously he was a sales engineer eith Ferranti and TDS.

PUNCHING is getting faster and faster, if you go by the evidence of Univac's Operator of the Year Competition. This year's winner, Leila Evans (above) hit an all-time high of 27,726 key depressions per hour, even better than the performance which won her the title in 1979. Leila works for Manchester computer bureau Greenfield and Dixon, and she won £500.

Michael Edwards has been appointed sales manager for SEMS, UK, the British subsidiary of the French Thomson CSF group. Edwards was previously with Gamma, Digital Equipment, Singer, and IBM, and was general manager for Litton Industries Inc.

John Williams is managing director of Zygal's newly formed subsidiary, Zygal Services. He was previously technical services manager with Telefile Computer Products GmbH.

Sweatt dies

Harold Sweatt, former chairman of the board of Honeywell, has died at the age of 88. He became president of the company in 1930, and when he retired as board chairman in 1961 Honeywell had become one of the world's largest computer manufacturers. During the war and later he served in several government groups.

Pall Mall recruiters

RECRUITMENT consultants Sara Taverner and Marilyn Black have joined forces to set up a London company specialising in the hiring of permanent DP staff.

They both have considerable experience in DP recruitment: Black has been in the business for 10 years, most of the time with John Goldsmith, and Taverner has also worked for Goldsmith, after five years in recruiting in London and New York, with a software house as well as agencies.

Black and Taverner Associates is at 17 Waterloo Place, off Pall Mall.

Trevor Hemmington, terminals sales manager at Terminal Display Systems, has been promoted to divisional manager for colour products. Alex Smith has changed from Southern division terminals salesman to sales engineer for the North and Scotland. Alan Studholme, previously with Baric and Redifon, has joined TDS as sales engineer in the West Midlands, and sales office manager Roger Crumpton now covers the Northern Home Counties and London as sales engineer for colour products.

Black Taverner

John Gould has joined DRG Bu ness Machines as software man from Beecham's, where he wa ject manager for the prop divisions in the central UK com services department. Tony ll more has been appointed t new post of manager system vices at DRG. He was formerly gram project manager for C at Burroughs' application de ment centre.

Fred Mewitt, ex-Ferranti Co has joined Benson Electronic sales office administrator and officer with salesmen in the f Doyle has been promoted to promotion manager. Alistair kins, previously with 3M UK, Benson with responsibility for of plotter accessories and for shipping and distribution of ment. John Gregory joins as service engineer.

DIARY

JULY 15
Debate, Pascal is not a practical programming language/AGM. ACM, UK chapter. BCS, 13 Mansfield Street, London W1. 6.30.

JULY 17-18
Meeting. IBM Computer Users' Association Local Authorities Group. Shire Hall, Warwick. Details: Mrs Speciale, 01-551 1843.

JULY 21
Solution of linear programming problems with staircase structure. Prof O. B. Madsen. BCS Mathematical Programming Study Group. London School of Economics, London WC2. 6.30.

SEPTEMBER 1-2
Microprocessor workshop. Co puter Lab, University of Liverp

SEPTEMBER 3-5
Logic and microprocessor sy design course. Computer Lab, versity of Liverpool.

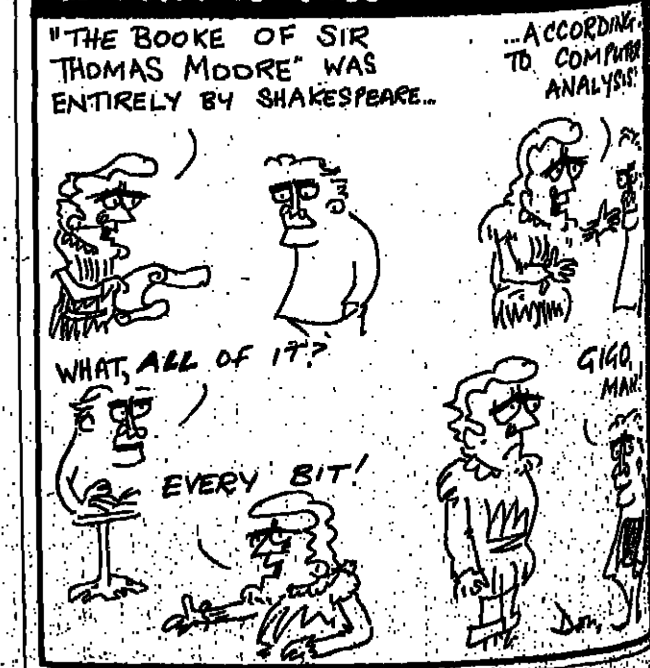
SEPTEMBER 23-26
Micad 80, CAD confere Micado. Paris.

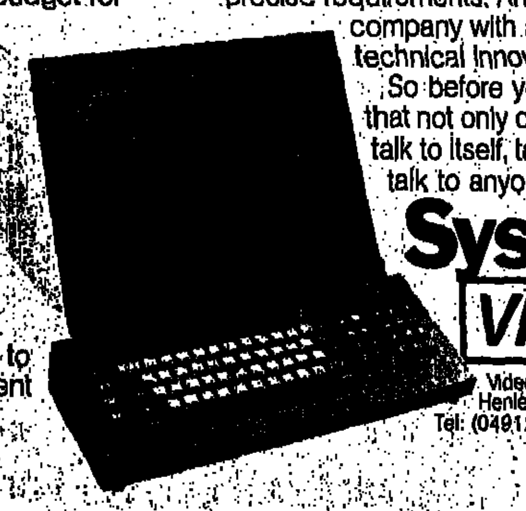
SEPTEMBER 24
New technologies for inform retrieval. BCS Information Retr Group. London.

NOVEMBER 6-7
Minis, micros and terminals co ference. BCS/IIS. Manchester.

Liveware File

by D





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by Eileen Staine

HMOS is key to '10 times faster' CPU

USING HMOS 11, Motorola hopes to have an 8-bit CPU 10 times the power of the NMOS 6801 with 16 to 32K-bytes of ROM, 2K-bytes of RAM and multiprotocol serial I/O channels or intelligent parallel channels, by 1985.

The company expects to have the technology operational by 1981 or 82 and will be in a position to sample a 256K dynamic RAM the following year. A time lag of two years is probable between the development of first samples and volume production.

Other products originating with the HMOS 11 technology are a 64K static RAM, a 128K EPROM and a 256K ROM. These should be appearing over the next two years.

HMOS 111 is also being thought about: it uses track widths under one micron. Initial samples of a 1 mbit dynamic RAM using HMOS 111 are expected in 1984-85.

In the 32-bit processor race Motorola has not prepared a follow-up to Intel's recent announcement of its future plans (CW, June 19). In fact the company considers that it was the power of the 68000 that encouraged Intel to pre-announce its plans.

According to Motorola the market has not yet been defined for a 32-bit product and when it is it will be small compared to the 16-bit market. The 68000 has a 32-bit internal architecture and can be extended whenever the market needs it.

At present one quarter of the instruction set is unused. It also has an immense peripheral set planned for the next few years (CW, June 19).

Today, Motorola estimates that it has 25% of the world market for 8-bit microprocessors. The total market for microprocessors and peripheral circuits at the moment is worth $330 million but this will become over $1,000 million. The company thinks that the market will be dominated by 8-bit devices in both volume and value.

Immediate plans include the sampling of two new memories: a 150 nanosecond access time 16K dynamic RAM and a 16K by 1 bit static RAM, the MCM 2167. The first product will have a single +5 volt power supply and will be in volume production early in 1981.

The 2167 will be sampled at the same time, in the last quarter of this year, will have a 55 nanoseconds access time, a power dissipation of 700 milliwatts in operation and 100 milliwatts in standby mode and will be in a 20-pin package. Motorola is already sampling a 2K by 8-bit device.

Samples of a 16K electrically erasable PROM will be introduced by the end of the year, with volume production expected next year. Designated the MCM 2816, the floating gate technology device will have a 350 nanosecond access time, a 10 millisecond programming time, a 50 millisecond wash-out time and a lifetime of 10,000 to 100,000 erase cycles.

Motorola considers that, by 1984, EEPROMs will be 17.1% of the programmable memory market, but it does not comment on the situation of the equivalent device, the EAROM which today has 4.7% of the market.

Two-day seminar

A TWO-DAY seminar on "Choosing and using microprocessor development systems," which is being jointly organised by Sira Institute and ERA Technology, is to be held at the London Press Centre, EC4, on October 1 and 2. Further details can be obtained from Sira Institute, South Hill, Chislehurst, BR7 5EH.

68000 delays

PROBLEMS with production at Rockwell have caused delays in the development of 68000 samples. As a second source to Motorola, samples were due in the second quarter of this year.

Anti-trust suit from ex Apple dealer

FORMER Apple distributor in the US, High Technology of Oklahoma City, has filed a $70 million anti-trust and breach of contract suit in St Louis Federal Court, Missouri, against Apple Computer of Cupertino.

High Technology claims that Apple terminated its distributorship last February after attempting to restrict its marketing area to six states, delayed deliveries and diverting them elsewhere.

The distributor also claimed Apple had promised to buy it at four times annual earnings, but instead made an offer at book value.

With profits expected to exceed $150 million this year, Apple still refuses to go public in the US.

Pascal versions

THE high level language Pascal continues to win acceptance on micro-based systems. Intel's Pascal 80 is available for use on Intellec microcomputer development systems from Jermyn Systems of Sevenoaks, Kent and Lucidata of Oosteinde has announced an extended version of its Pascal P-6800 for use on Motorola 6800 and 6809 based systems.

Pick ops system added to Z8000

A MARRIAGE of the Pick operating system and the Zilog Z8000 16-bit micro is under way at Applied Digital Data Systems, promising to bring the Hauppauge, New York terminal manufacturer into the micro business systems market.

The Pick operating system is the basis of the software on the Microdata Reality system, and has also been adapted for Honeywell's Level 6 minicomputer. This product is marketed in the US and the UK as Ultimate by Universal Computers (Software File, March 27).

A third company is also marketing a version of the operating system in the US. Called Evolution Computer Systems Corp of Irvine, it is importing minicomputers from Intertechnique in France, which has continental European rights to the operating system and builds minicomputers developed from Microdata licences.

The new Adds system is due to appear at the end of the year, and Dick Pick himself is tailoring the operating system to the Z8000 for exclusive use by Adds.

It has a data retrieval and report generator language English which it supports and which is claimed to be easy for non-specialists to use.

Adds has introduced its tivision series of business puters for the OEM Based on the Intel micro, the line is offered in models, and runs under proprietary version of the operating system, which tures additional disc and multitasking facilities, is programmed using terpreter and compiler Microsoft. Standard CP/M grams run under the operating system modification.

Multivision 1 offers byte processor with 70K on two minifloppy disc plus a video terminal printer ports. The Multi version has an 8-inch ester disc carrying five megabytes, from Memorex or Shugart, while model extends memory 256K-bytes and supports terminals, giving 64K-bytes user.

$50 million Canada boo

FEDERAL help worth $50 million is to be Canada's advanced industry during the years to make it more petitive internationally.

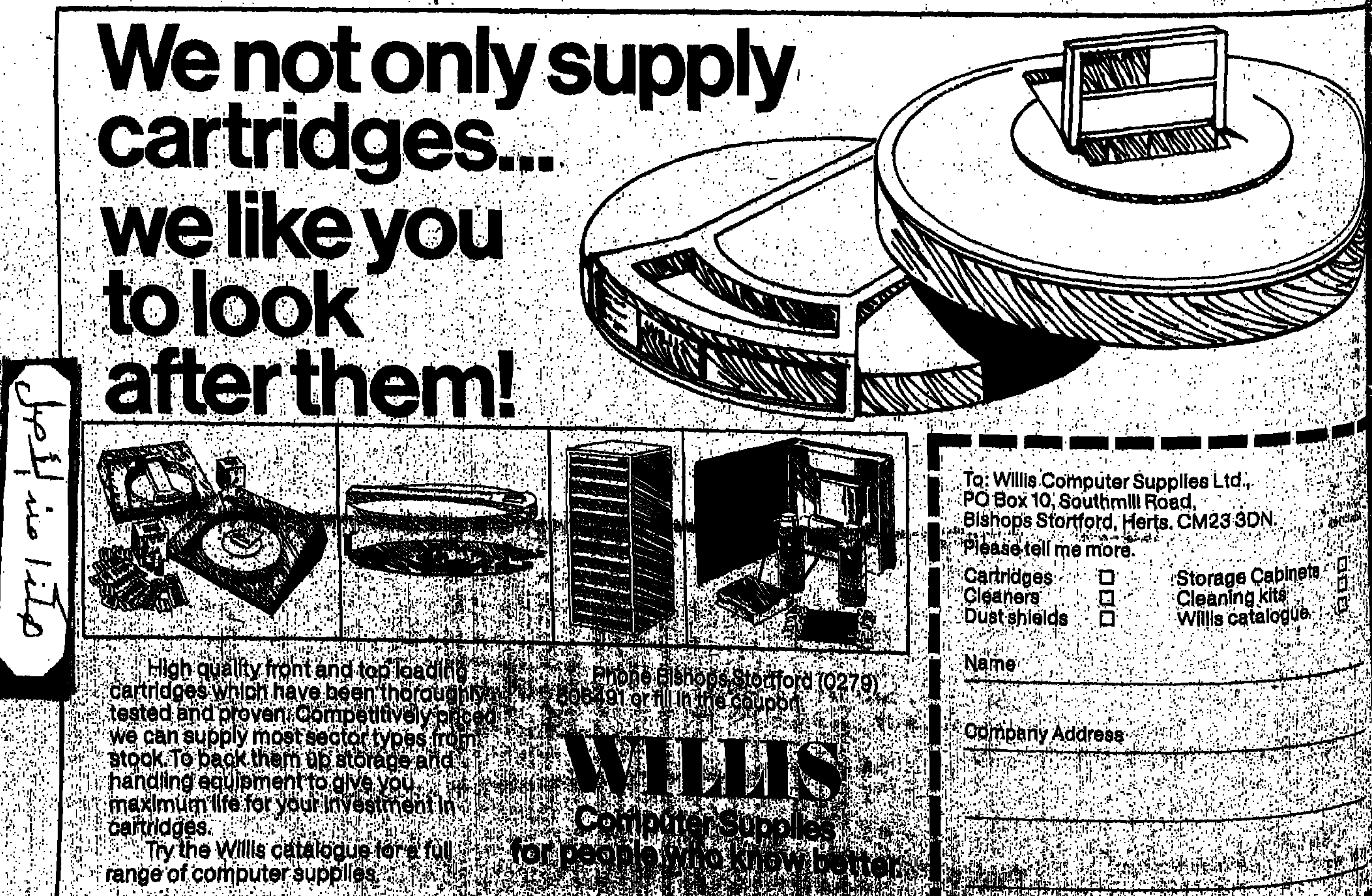
Mitel Semiconductor Bromont, a subsidiary Ottawa, is to receive to increase production, and development of CMOS devices.

Mostek's 64K dynamic RAM is sampled

INITIAL samples of the 4164 64K dynamic RAM have been produced at Mostek's Dallas plant. The chip requires a single 5 volt power supply and dissipates a maximum power of 300 milliwatts.

With a choice of three access time ranges, 100, 120, and 150 nanoseconds, the 4164 requires a 128 cycle every 2 milliseconds refresh input on pin one of the 16 pin package. Mostek hopes to produce a 128K device in a single 18 pin package by adopting a hybrid approach, using two of the 64K parts.

The company predicts that it will have a 256K-bit dynamic RAM available by 1984.



Dr DOUG EYEIONS REPORTS FROM SECOND WORLD CSA CONGRESS

Service firms should lead fight against inflation

WAYS in which service companies could help convert the new resources produced by advanced information technologies into higher productivity was the main theme of the second World Congress of Computing Service Associations.

Held in San Francisco, it attracted over 700 delegates from 20 countries, including 50 from the UK out of a European contingent of over 200.

Hosted by the American Data Processing Services Organisation, the US equivalent of the Computing Services Association, the three-day event had a transatlantic flavour.

It was opened by ex-President Gerry Ford who called on the congress to "stand up for free trade". It was expected that this would be the opening shot in the battle over trans-border data flow.

While Europe is treating the issue as an item of major concern, it is the flow across the 49th parallel betwen the US and Canada that is causing the most controversy.

The US favours a free flow of data while Canada is trying to protect its independence and home industry.

In fact, speakers were restrained, confining their contributions to technical aspects of telecommunications or to generalisations about the subject rather than presenting specific examples of actual restrictions of data flow which have occured in practice.

Congress heard speakers say the greatest need during the present decade would be to boost productivity in order to beat inflation. The speakers also pointed to the social responsibilities of the computer services industry and to the fact that new services were still in great demand despite economic pressures.

The detailed topics of the computer service business were covered in eight sessions of five concurrent meetings. As the average number of platform speakers at each meeting was three, there were well over 100 contributors to these subjects and it was not possible for one individual delegate to listen to more than a small fraction of the speakers.'

This was one criticism of the arrangements, because five parallel meetings did seem too many, with delegates never sure which meeting to opt for and not able to move around comfortably between the rather small rooms which were overcrowded for the more popular topics.

There was at least a second chance to see Alex d'Agapeyeff who spoke on software portability at one session and on application machines at a second. In fact, CAP was very much in evidence with Barney Gibbens chairing the first of these two sessions and chairing the closing plenary session as a member of the Programme Committee for Congress.

Other speakers from the UK included Peter Merrick on productivity; Donald Moore of Peat Marwick Mitchell on multinational management; Alex Jones of Comshare on government policy and PTTs (he heads the specialist committees at both the CSA and ECSA on this subject); Brindley Reynaud of Hoskyns on international marketing in the third world countries; David Gibbons of Marcol on international distribution; Roger Graham of Business Intelligence Services on educational standards; Tom McCafferty of Frazer Williams on managing growth; and John Jarvis of Pactel on union relations.

Brian Mills, late of BOC, contributed to a heavily attended session on mergers and takeovers. The great interest in this subject probably arises from increased activity in this area because 1979 saw 107 US service companies taken over for a total of $671 million.

Admittedly, National CSS accounted for $167m of this total (a record for the computer service business) and the take-over of Data Resources Inc by McGraw Hill accounted for a further $103m.

But there are still a lot of mergers being negotiated or potential mergers being investigated and the congress provided the convenient shopping place for any potential buyers with so many executives of computer service companies gathered together for three days under one roof.

Although these statistics and many others given by other speakers confirm that the industry is still booming at a time of general recession, the conference received a wise reminder from Professor Theodore Levitt of Harvard Business School that there was no such thing as a growth industry — only companies that were organised to take advantage of growth opportunities.

He also pointed out that in a service business "your customer never knows what he is getting from you until he doesn't" and this is the most important paradox for computer service companies who have to keep their customers constantly aware of the service they are supplying.

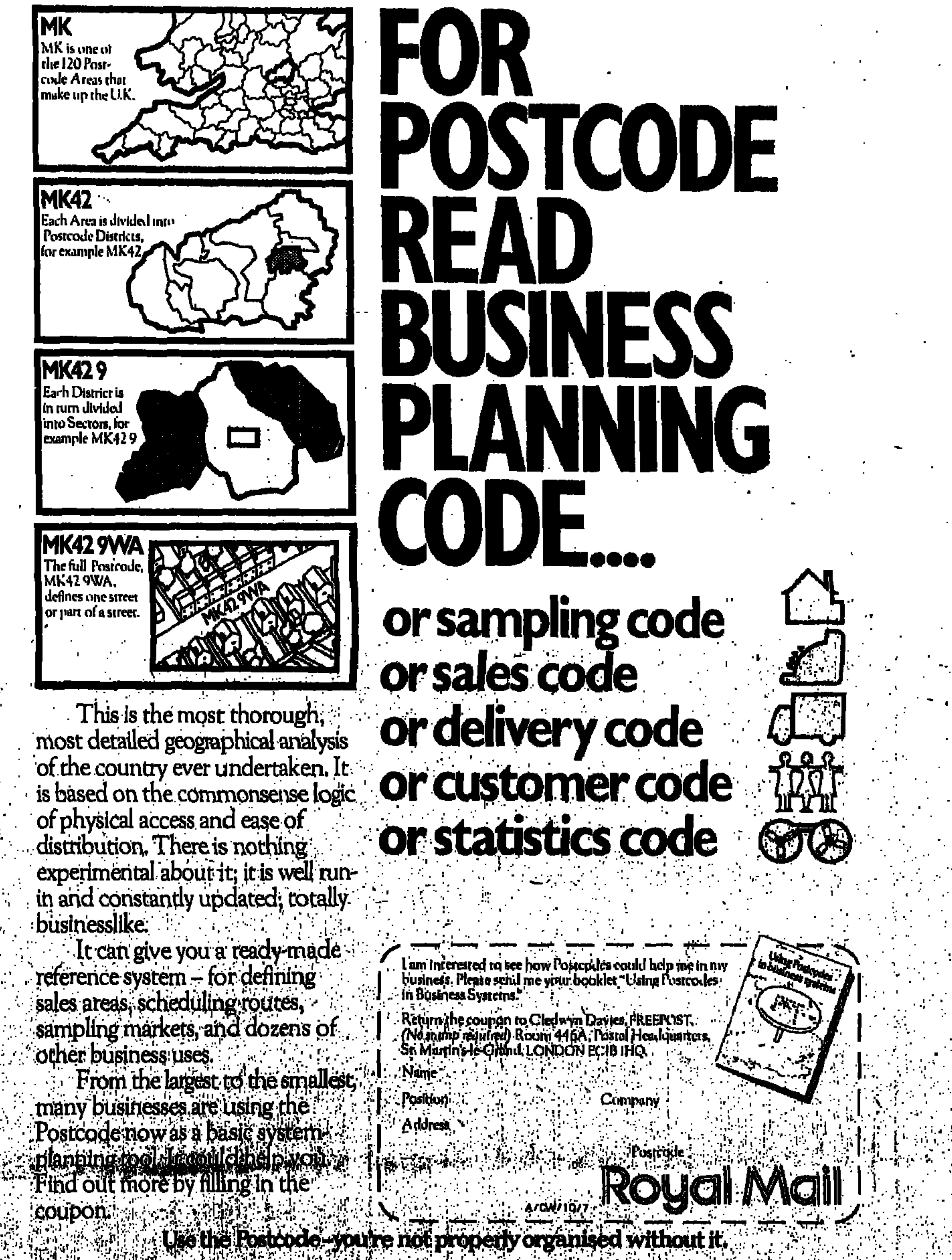
One of the outstanding speakers was futurist Alvin Toffler who talked about "the electronic cottage" and "the third wave" which followed the agricultural revolution and the industrial revolution and would see the abandonment of commuting.

He referred to a "data-drenched" society, but it took humourist Art Buchwald to have the last word on this subject when, as the final speaker, he talked about the number of computers now being so large that there was danger of a "data famine" with not enough data available to feed all the hungry computers.

This was a good natured note on which to end. We had taken over the whole of the San Francisco Marine World Safari Park for one evening's entertainment and most present pledged themselves to meeting again at the third congress in Copenhagen in June, 1982.

SPEAKERS at the second World Congress of Computing Service Associations said that the service industry could lead the fight against inflation by converting information technologies into higher productivity.

Director general of the UK's Computing Services Association Dr Doug Eyeions attended the congress and reports on the proceedings.



The IBM System 38, now being delivered in the US one year after the date originally planned.

IBM delay time well spent says System 38 user

"WE'VE had the third release of the System 38 software for about three weeks and it's really quite solid and quite good. It has a few minor quirks in it but only the kind of things you get even in mature software. As for the hardware, it is superb in terms of functionality, reliability and performance, and IBM has made very good use of the year's delay in getting the product out."

So said the first user of the System 38, which IBM started shipping in the US last week, one year after its original planned delivery date.

The user, one of three who have had their System 38s for some time, is the New York branch of United Merchants and Manufacturers, a big textiles, plastics and chemicals company. The DP manager at the site is Larry Brenner, who is in process of converting a mass of online and batch RPG II programs from an IBM System 3/15D to RPG III on the System 38.

"We've had our machine for three or four months," he told Computer Weekly. "We have converted a major online application which consisted of more than 100 programs, and we have also done several batch applications using the conversion facilities."

IBM announced a facility for running applications under the online Communications Control Program from System 3 on the System 38 in emulation mode and later withdrew it (CW, January 17).

"We think it was a good thing they withdrew it," commented Brenner. "From what we saw of it, it was quite slow and not the best way to do it."

Brenner is very pleased with RPG III, and is broadly satisfied with the conversion process.

"We had two people, and we've recently got two more, plus myself — I dabble a bit. We were up to two to three programs a day once we got used to it, and there are now several conversion facilities which will lead to conversion utilities and make the job much easier, so one could get up to five or six programs a day.

"One can't really tell where RPG III ends and the other parts of the system software begin, but RPG III plus all the other things on the System 38 make it excellent. But you should view it as a whole system rather than looking at RPG III in isolation."

As well as converting the online application and several batch programs, the company has written an order entry application from scratch, and again the software facilities came in for praise.

"We got a three to four times improvement in programmer productivity on System 38 compared with program development under CCP," said Brenner.

"When we first asked IBM what the improvement in power would be they told us it was hard to say. But we have to admit that they are right: we find that some applications run in a quarter less time than on the System 3, others only one tenth less time.

"We can't say what the response time is like because we've only got eight terminals on our machine, so it is effectively instantaneous. But before we g our machine, we had temp access to one at IBM, and th had 40 terminals on it and response time on that w good."

The most interesting fea of the System 38 is the integ relational database system, United Merchants has no experience of that yet.

"We have to get through conversion first so we have made use of any database tec niques yet, but our new syste will make use of it and, we learning as we go along," sa Brenner.

United Merchants has seve computer locations in the U one with a big 370 and seve with System 34s.

"The delay did cause us pr blems, because we have se System 38s on order and we h to get more System 34s as st gaps, and that has involved extra conversion which would not otherwise have ha do.

"Our machine is lightly load at present, and is meeting expectations. It will be a good machine for remote w king, and IBM has a very ma system for its stage of deve ment. It is a much better sys now than it would have bee they had been able to ship when they intended, and the have spent the extra time we

Two other customers, Ri Machinery and Supplies Minneapolis and St Olaf Coll in Northfield, Minnesota, hav also had System 38s for so time on pre-release. Shipme to other US customers beg last week.

French to invest in 'bureautics'

THE French government intends to pour money into the "office of the future" or "bureautics" as the French have chosen to call the burgeoning world of new office technology.

Jean-Claude Pelissolo, who heads the French government agency within the industry ministry that looks after the electronic and computing industries, outlined the government's thinking last week.

He divides the market into four sectors: specialised products, mass-market products, communicating systems for small companies, and integrated systems for industrial and commercial giants.

The latter two have been identified as the most promising and will therefore be allocated the lion's share of government support, which could run into thousands of millions of francs — several hundred million pounds — if the right kinds of projects are put forward. Aid will take the form of development contracts and will embrace all the various existing mechanisms of support.

The government plans to nominate two large companies as standard-bearers for the development of comprehensive integrated systems, laying emphasis on collaboration between companies already in the market.

New products are expected to take 60% of the market between now and 1985 and depending on the success of the national plan, France could by then at worst be importing 11,000 million francs worth of office products and exporting 1,500 million, or at best be importing 7,500 million and exporting 8,000 million. In the latter case, imports would primarily traditional produ like typewriters and copiers.

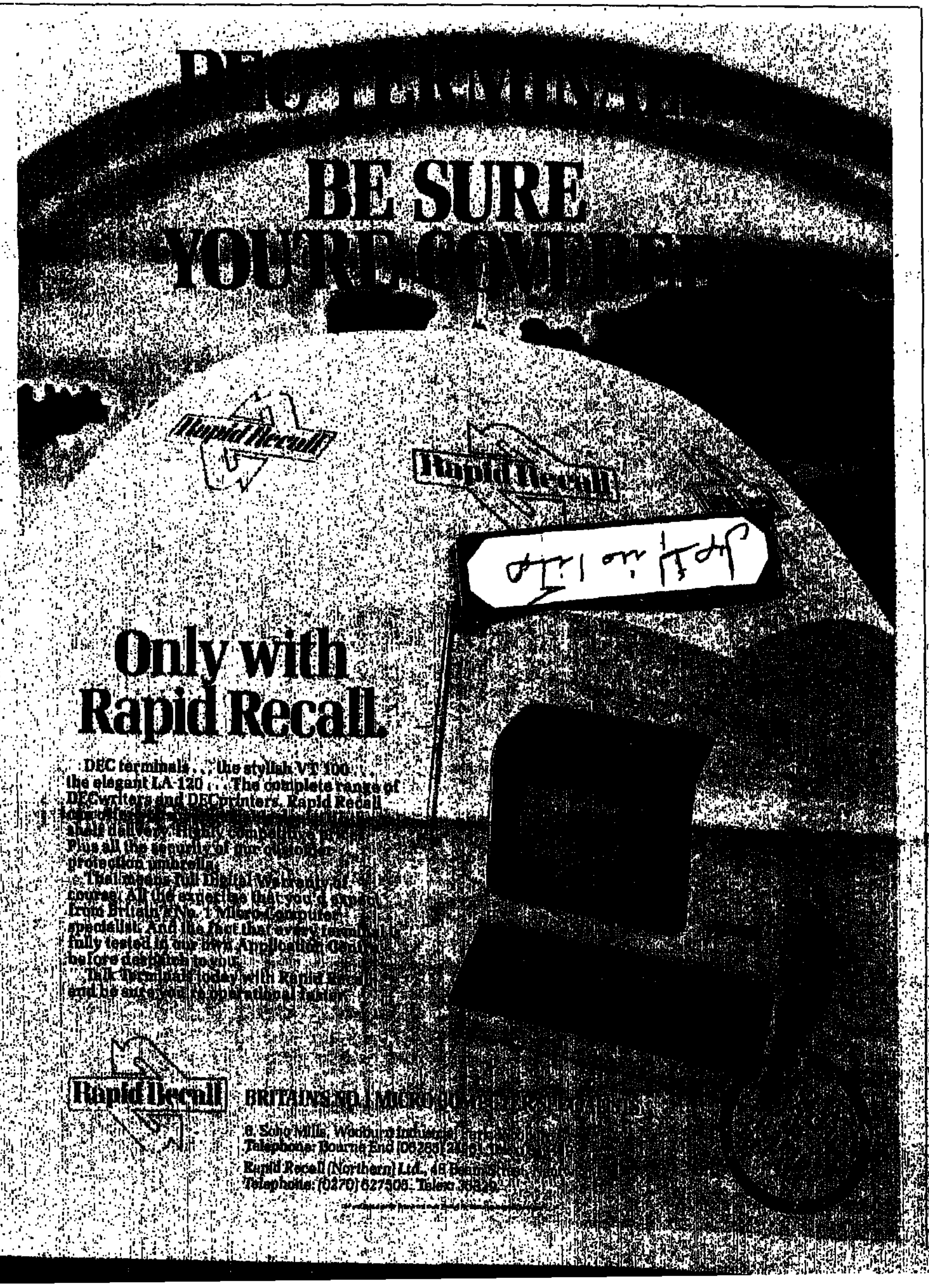
In recognition of the grow importance of office technolog the French Club de la Per Informatique, which has members manufacturing kinds of small systems peripherals, has formed "bureautics commission." purpose will be to establish needs of users in the of automation field and to prom the products of members, whom have joined the group within the club.

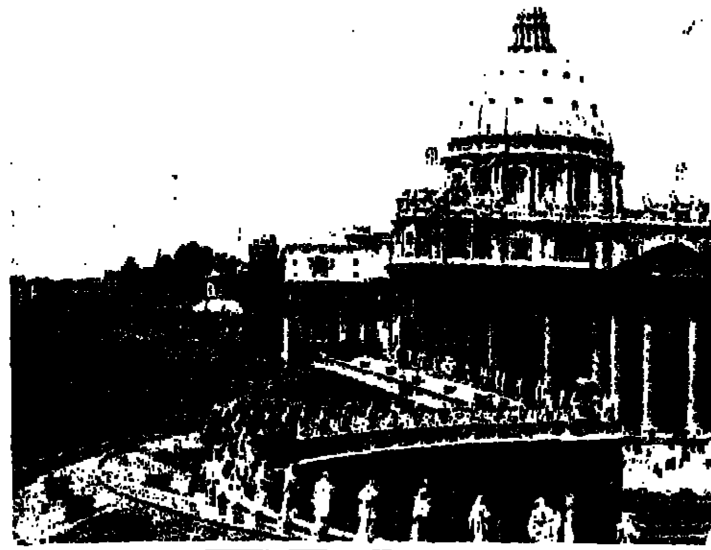
Japan/France collaboration

COLLABORATION between Japan and France on computers semiconductors and robotics being discussed at government level, according to To reports. Senior French gov vant Jean-Pierre Souvira said to have put forward pro sals to the Japanese Ministry International Trade and In dustry.

Norway deal

AS part of a distributed entry and stock control sy SPL International is [illegible] hand-held data capture minals in the [illegible] warehouses of [illegible] Kooperative Landsfor [illegible] retail and distribution [illegible] tion in Norway.





Consensus on transborder data flow needs

Conflict over cross-border data flow has been simmering for years. North and South and business and government have felt themselves to be enemies, but at the Intergovernmental Bureau for Informatics conference on data flow there was much more agreement than anyone expected. Our special correspondent reports from Rome.

INTERNATIONAL co-operation on harmonising controls over cross-border data flow has started to look like a real possibility, following the major conference on the subject in Rome, attended by representatives of over 60 countries. What was expected to be an acrimonious clash between North and South and business and government ended with a surprising amount of agreement, and the setting up of joint working parties to tackle problems in detail.

There was shock, however, at the announcement that Brazil is close to deciding to channel all international data traffic through "gateways," and impose a tariff policy for information services, for political purposes. From Cuba as well came the blunt assertion, "Cuba is opposed to the free flow of information because this is a ruse to allow continued exploitation by multinational corporations."

The conference was organised by the Intergovernmental Bureau for Informatics, a Unesco offshoot, to follow on from the Torremolinos meeting on informatics policies held two years ago (CW, September 7, 1978). Many delegates at Rome echoed IBI director Fermin Bernasconi's view that "transborder data flow is the lifeblood of international economic relations, and we must try to achieve harmonisation in this field." Worry that conflicting rules in separate countries could lead to ill-conceived interruption produced a broad commitment at Rome that there has to be world-wide co-operation.

The French were in the forefront of moves for international co-operation, insisting that data flow needs to be considered in the broader context of the "informatisation of society." French ambassador to the OECD, Christian d'Aumale remarked that there was a serious lack of any efficient means of measuring the volume and strategic importance of data flows.

The three working parties established are to look at data protection and sovereignty, economic and commercial aspects of data flows, and the impact of data flows on national information policies. They are expected to report in 1982. The fact that private business is involved in the parties was a significant step in reducing the tension between different sides.

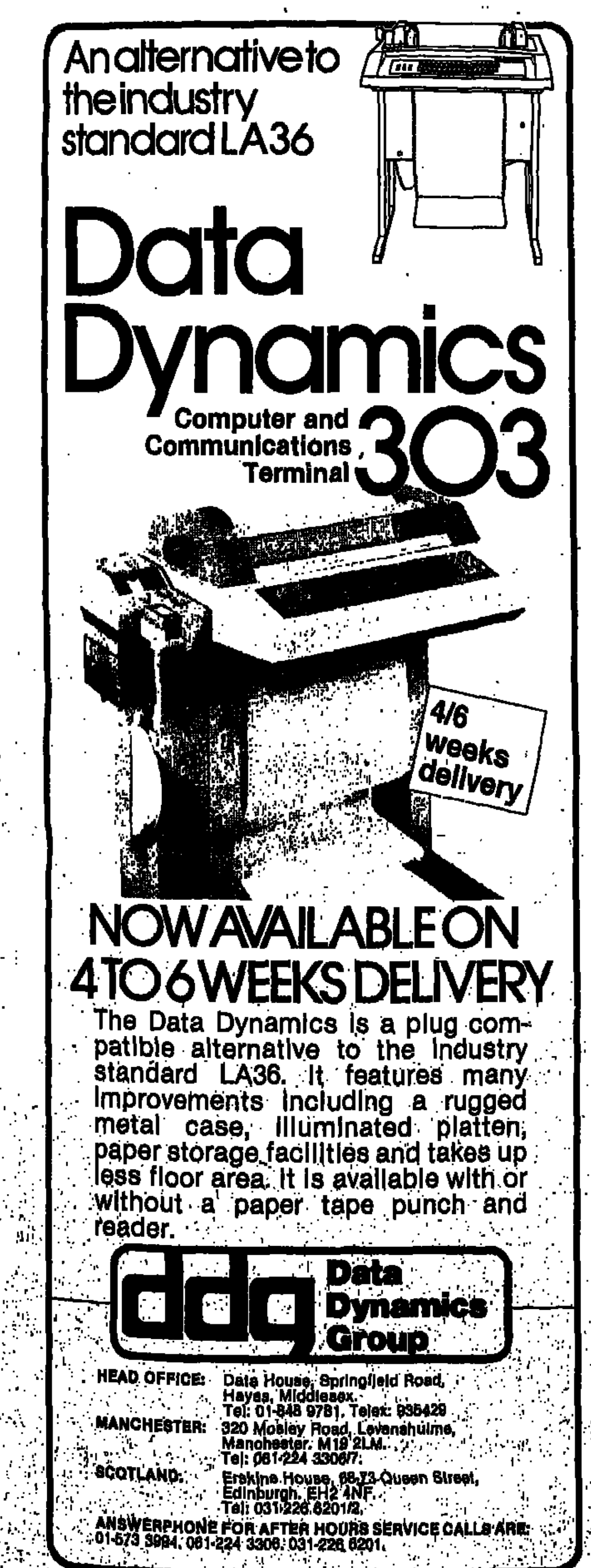
The old issue of the imbalance of data flows between the developed and non-developed worlds did arise, but not as bitterly as expected. The US delegation was prepared for attacks on the large US share of the DP and telecommunications market, and these did not come.

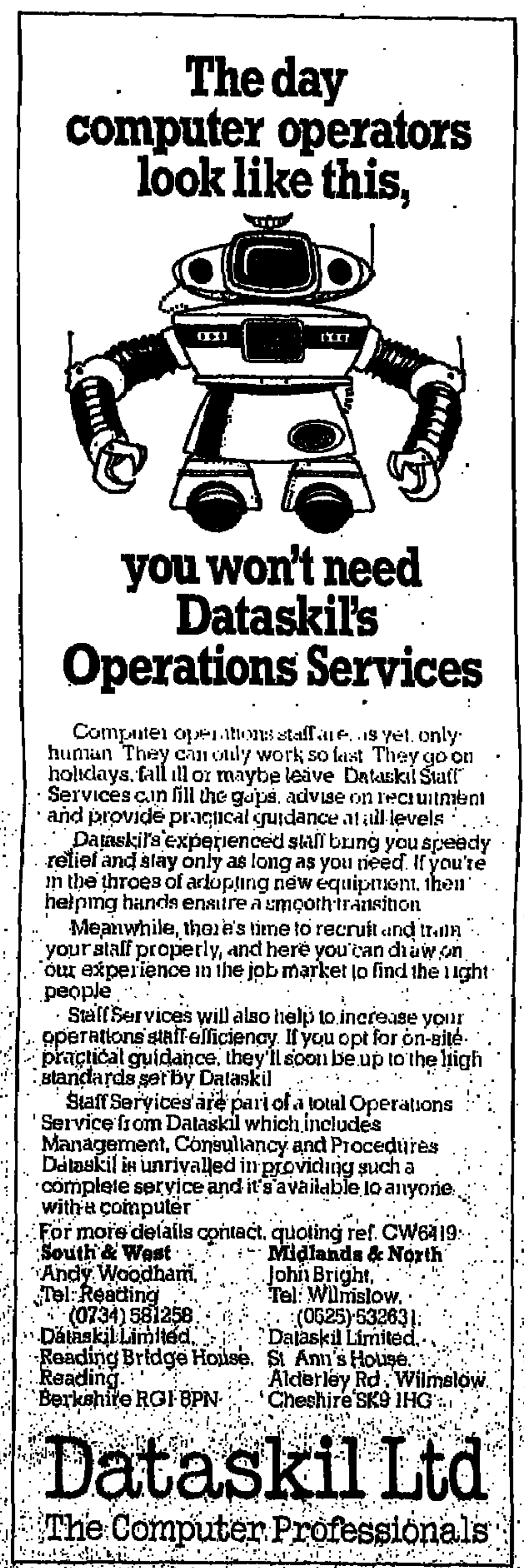
The director of the Brazilian government's Informatics Secretariat, Joubert de Oliveira Brizida, was among the most blunt in his espousal of the cause of intervention. The advent of teleinformatics, he said, had led "in a sophisticated and often harmful way" to the geographical separation of the decision-making and production processes. Rephrasing this, he said that a country not concerned about the control of strategic information resources ran the risk of becoming intolerably dependent on political and economic interests outside its borders.

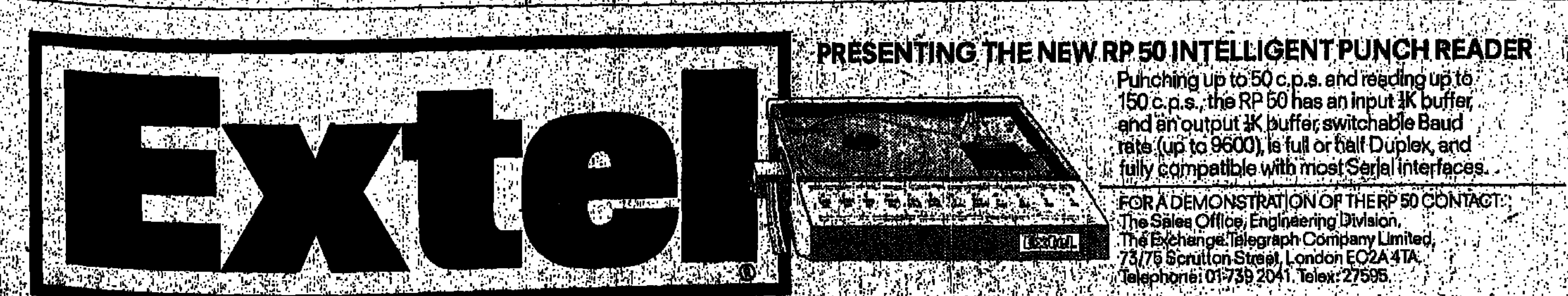
Brizida announced that his government had almost decided that all international data traffic must be channeled through gateways, which would act as "customs houses" for the flow of information. Tariffs could be imposed, and a general check kept on information. In particular, it would be easier to enforce Brazil's rule that data processing work must not be exported if it could be done locally; this was being evaded by some companies (CW, December 14, 1978).

Charles Dalfen, chairman of the Canadian Radio Television and Telecommunications Commission proposed the formulation of "computer pacts," similar to the agreement currently operating between the US and Canada in the car market. The pacts would combine markets and allocate specific manufacturing and service jobs to specific groups in the different countries involved.

The use of earth resources satellites by developed countries was also a matter of concern raised by the less developed nations. There have been instances where crop failure in countries like Brazil have been known about in Northern money markets before the governments in the countries concerned have been aware of anything.







ADVANCED FILE DESIGN—Part 13

by Owen Hanson and Norman Revell

Second design parameter for online systems

IN Part 12 we examined the way in which reliability calculations can influence the design of the file subsystems of an online system. In this part we look at the second design parameter for an online system; that of response, and examine the effect it has on the choice of file organisation.

First, we shall develop a simple queueing model which can be used to calculate the response time for a system processing transactions which arrive at random. Suppose we have an online system where '*n*' transactions per second arrive randomly distributed, and that each transaction requires '*t*' references to a disc file the mean access time of which (seek plus search plus data transfer) is '*d*' milliseconds.

The general single-server queueing theory formula for the mean response time, given random arrival time and service time distributions, is

$$T = \frac{s}{1-p}$$

where T is the response time, *s* the mean service time and *p* the facility utilisation.

In this example the facility utilisation is given by

$$\frac{ntd}{1{,}000}$$

and so the response time for each disc reference becomes

$$T = \frac{d}{1-\frac{ntd}{1{,}000}} \text{ msecs}$$

The graph in Figure 1 shows a series of curves of response times for different values of disc access times in the case where $t = 1$.

It is interesting to note how modest the loading needs to be to bring about a response time of double the service time, 50% in fact, whereas intuitively it would seem reasonable to allow a greater load factor than this.

At very high load factors response times would grow extremely long — as anyone queueing at a supermarket at a busy period knows. There is a further penalty in that transactions queueing in the system need buffers to store them if terminal keyboard lockouts are to be avoided.

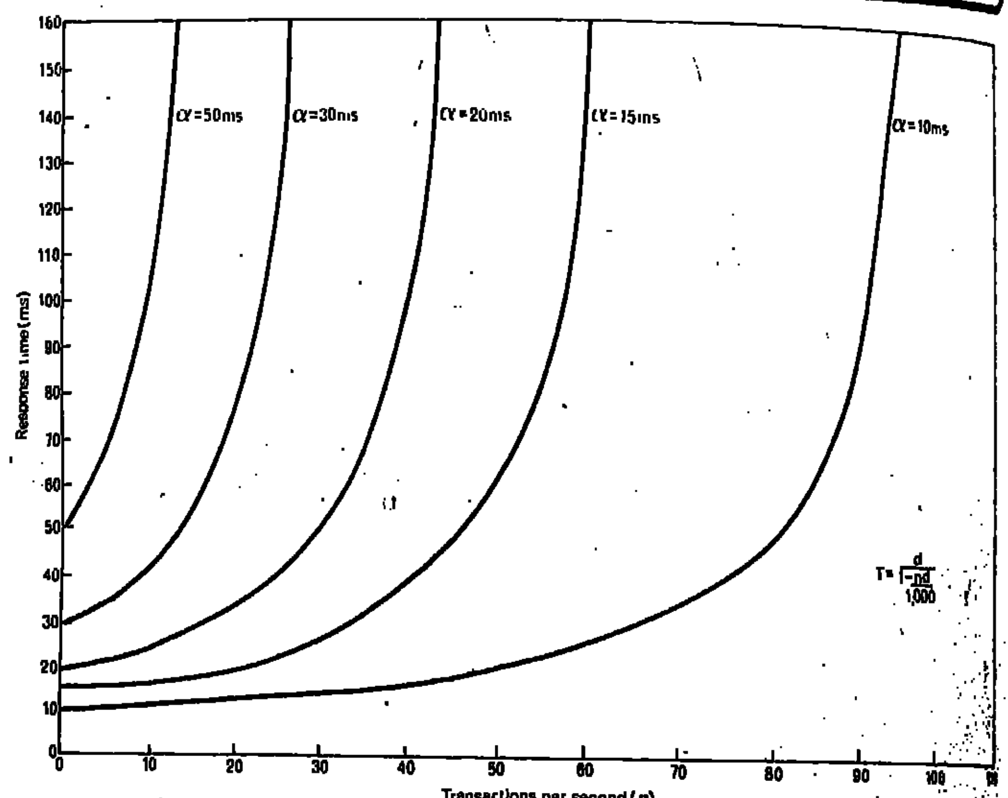


Figure 1.

Effect of file organisation and structure

In practice when an online system is being designed, the response time has been specified and the designer has to choose an appropriate file organisation and disc unit to meet this time for the specified transaction volume.

The choice of file organisation will affect the number of references '*t*' per transaction. For example if the file to be referenced were an indexed sequential one then *t* would always be at least two for a single reference to the file, whereas a well organised random file (see earlier parts) would be not much over one.

As we have seen from the formula and graphs the effect of increasing the number of accesses required is not linear. For a 50 millisec mean access time disc, at five transactions per second the response time for IS would be at least 100ms (t = 2) for each reference (ie 200ms for the complete transaction) whereas for a well organised random file it could be of the order of 66ms (*t* = 1).

In some applications where there is not the need to update master files immediately, transactions are simply stored in serial form in files known as buckets. Here the term refers to a whole file and not a randomising unit or unit of transfer.

This guarantees that only a single access to disc is required to store the transaction for later processing. The factor *t* depends on the number of files accessed as well as the organisation for each file, and as we have seen any method of minimising this factor can have a major influence on the response time.

For example, small reference files such as those found for product descriptions, discount rates and so on, should be held in main storage wherever possible. If a random file is being used, it is also possible to reduce the disc response factor *d*, since by using the technique of access frequency loading (see earlier parts) the mean seek time will then be less than that for the whole file.

Many online systems are implemented using standard manufacturer's IS file organisations in order to save design effort. While this may help to implement a system quickly, and may give an acceptable response when a system first goes live, the response time may become unacceptably long as the volume of transactions increases, and a conversion to random organisation will then be necessary in order to avoid the purchase of additional and/or faster discs.

The choice of file hardware

The other factor which the designer often has control over is the choice of disc hardware. Suppose the file organisations have been optimised as described above, how may the designer then proceed to select the disc units to meet a target response figure?

Given a knowledge of the other variables it is possible to calculate the mean access time of disc required for a given application using the formula

$$d = \frac{T}{(1 + \frac{ntT}{1{,}000})}$$

When a system is becoming heavily loaded a choice has to be made between replacing the disc drive(s) by a faster one or spreading the files over extra drives (thus reducing the load factor *n*). Let us take as a simple example a case where a single disc drive holds an online file, and there is a choice of either splitting the file across two drives or acquiring a single drive twice as fast (half the mean disc response time *d*).

The first option gives a response

$$T = \frac{d}{1-\frac{ntd}{1{,}000}} \text{ msecs}$$

whereas for the second option of a faster drive we have

$$T = \frac{d/2}{1-\frac{ntd}{2{,}000}} \text{ msecs}$$

Thus the response time of the second option is only half that of the first.

In practice there will be other considerations such as the higher availability of the first option (see Part 12) and relative costs and capacities, but this calculation does provide an example of how simple queueing theory may be applied to the performance aspect of the decision.

The simple single-server queueing model used here has made certain assumptions about distributions of arrival times and service times; in practice these will amount to approximations since there may be "bunching" of transactions and the accesses to disc may not be entirely at random.

Nevertheless the theory provides a good first approximation, and if a more accurate calculation is required then it is necessary to use more advanced theory or build a simulation model — an effort usually only justified where load factors and similar data are known with great precision, as otherwise greater errors are likely to accrue because of bad estimates.

As with the reliability calculations dealt with in Part 12, queueing theory has wider applications than just the file design factors covered here. An example is the design of the teleprocessing system where equipment response must be calculated and included in the total response time figure.

The application to batch file processing systems is more limited since in a batch system there is an orderly flow of transactions through the system, though if a batch program were multi-tasking transactions for the same file, or multiprogramming caused a high degree of contention for a given disc drive, then it is possible that queues might develop, in just the same way that queues are built and managed by some operating systems.

It is doubtful that these [illegible] are as accurately represented [illegible] a random arrival pattern [illegible] the queues caused by the terminal operators of an [illegible] system all working [illegible] dently, if only because [illegible] systems may have hundreds [illegible] separate users at any given [illegible]

REFERENCE

Design of Real Time Computer Systems. J. Martin, Publisher [illegible] Prentice-Hall.

Logica opens Swindon factory to build 2200

LOGICA is opening a factory in Swindon to build the new 2200 word processor for Nexos. It is planned eventually to have 200 staff, producing 2,000 units a month.

The 2200 was unveiled for dealers at Hanover Fair (CW, June 12) and is to be put on sale in the autumn for a price expected to be just under £7,000.

It is a development of the Logica VTS-100 stand-alone word processor and uses much of the same software, but has a completely new, more compact, housing. New software features include an arithmetic capability and new ways of handling tables.

Using the Intel 8086 16-bit micro, the basic 2200 will have 128K-bytes of store, allowing all the software to be memory-resident and thus eliminating the time wasted in swapping software in off floppy disc. [illegible] 256K-bytes can be installed providing room for new functions necessary when the machine is used as a terminal to Nexos' full-scale office system (CW, January 31). A [illegible]-on-black screen, thought by Scandinavian ergonomists to be easier on the eyes, is an option.

The price of the VTS-100 has drastically been brought down to around £7,000, having been originally very high for a stand-alone word processor. The 2200 will be slightly cheaper and so will the VTS-100, short as its life has been, will be superseded. The new machine uses custom-designed boards so there are no wasted components or space, and this helps [illegible] the manufacturing cost.

TIM PALMER REPORTS FROM LLOYDS BANK'S COMPUTER CENTRE

Flooding is only threat to centre

UNTIL the Thames Barrier is completed, the risk of flooding to Lloyds Bank's computer centre at the south end of Blackfriars Bridge, SE1 still remains a threat the bank cannot deal with.

The centre, called Samson House, has been compared with a battleship and aircraft carrier. Lloyds is the only major bank which has put all its computer eggs into one basket.

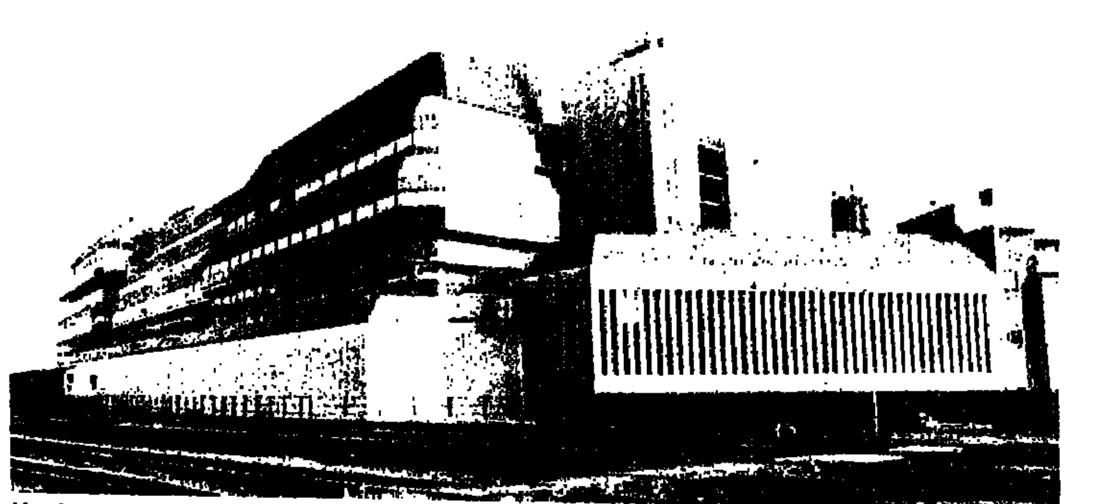
Most potential threats have been taken into account in the design and construction of the centre. Flooding would not damage the computers which are sited high up in the centre; but it would disable the generators in the basement.

The security system is controlled by an IBM System 7 minicomputer and entry to the centre is via magnetic stripe identity cards. These have to be used again to get further into the centre than the front office. The cards can also be used to restrict workers from certain areas.

If disaster did occur, Lloyds is confident that IBM would pull out all stops to provide back-up while the pumps got to work on the basement. Lloyds is IBM's best UK customer.

Like millions in Central and South London, Lloyds can only keep its corporate fingers crossed that the once every 50 years combination of weather conditions does not occur before the barrier, which is scheduled for completion in two years' time, is erected.

One of Lloyds' semi-automatic cash points that were developed for its branches which have insufficient business for the automatic variety.



Lloyds Bank's computer centre near Computer Weekly's London offices.

Paving way for credit clearing

THE process of cheque clearing, making use of magnetic ink recognition, has been automated for many years, but Lloyds is in the middle of a far more complex automation experiment, that of credit clearing.

The experiment was revealed in Computer Weekly last year (September 20, 1979), since when the banks have agreed a coding standard on their own credit documents, using OCR, and as well as Cummins-Ellison MICR/OCR readers. Lloyds is using OCR equipment from Scandata.

The experiment is progressing slowly, and is made difficult because of the variety of credit documents in use by various organisations such as public utilities.

Progress is being made with sorting the documents using a combination of OCR and MICR, but a full automation of the process is some way off, since so many bodies would first need to standardise their documents.

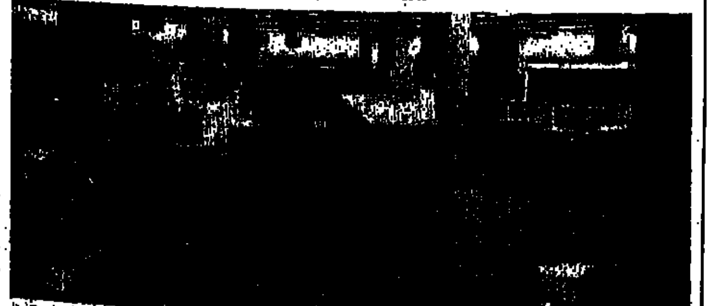
Semi-automatic cash points eliminate cheques

SEMI-automatic cash terminals are to be installed in smaller branches of Lloyds Bank where the amount of business done does not justify installation of a fully automatic cash dispenser.

In our picture the customer, left, runs his cash card through the reader, keys in his secret personal number and the amount he wants, and the cashier, right, checks that there are sufficient funds in the account on his screen before completing the transaction and handing over the money.

The system eliminates the need to clear a cheque and saves time for customer and cashier alike. The terminal on the left was designed to Lloyds' requirements and is now offered to other banks as the IBM 5906. The one on the right is a standard IBM 3604 counter terminal. The experiment at three Brighton branches started last year (August 30, 1979) and the bank is now going ahead, ordering 500 terminals.

Unused function keys could, in future, be programmed for functions such as making direct transfers from one account to another, requesting a new cheque book or a statement and so fourth.



One of the two large computer rooms at the centre. Each is a mirror image of the other.

Hopes that 3033s will enable shifts to be cut

SAMSON House includes two large computer rooms, one of which is shown above. The two rooms are configured as mirror images of each other, and each includes one 3033 with 12 megabytes of main memory and 12 channels, and two 370/168s, each with six megabytes and eight channels. Each is capable of backing the other up.

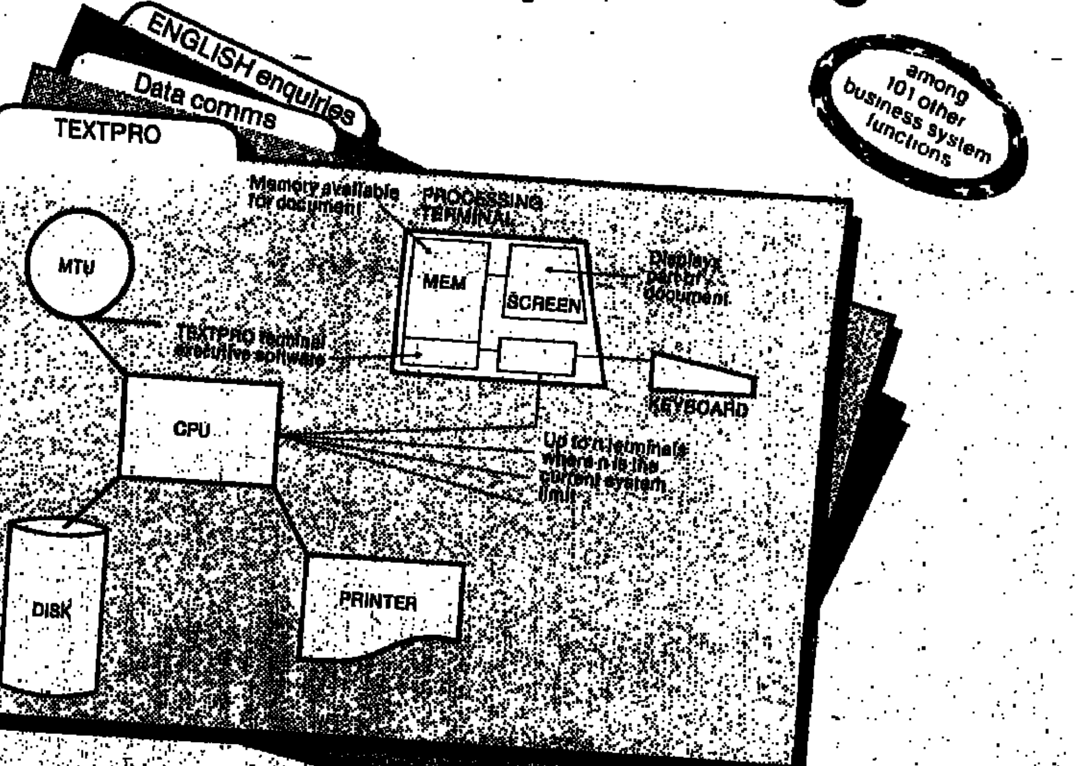
Further 3033s are on order for installation next year, and it is expected that these will be able to replace the four 168s. Two of these are likely to replace ageing 370/155s at the bank's Worthing unit trust registration centre but this will mean installing water cooling.

From 7.00 am on Monday to 10.00 pm Saturday, the computer rooms run three shifts a day, and development work is done on Sunday. At some point in the future, the rising staff costs curve will cut the declining hardware costs curve and the bank will cut back to two shifts a day.

Much is being expected of the 3033s, because the bank is in the early stages of implementing an IMS database for its accounts. It will be a policy rather than a technical decision, but it is thought possible that the new database and the power of the 3033s will make real time updating of accounts possible.

All the machines run as uniprocessors, the primary operating system being MVS/SE2, although the bank also has OS/VS1. Most programming is in PL/I with some Cobol.

The software and systems development unit at Samson House has 110 programmers and 50 analysts, usually recruited in-house, and is unusually well equipped. There cannot be many development groups who have one of IBM's high speed and expensive 3800 laser printers dedicated entirely to their work.



COMPANY NEWS

COMMENT

Artificial constraint on management

WHILE welcoming the solution chosen for the disposal of the National Enterprise Board's 50% holding, as we did last week, the necessity for imposing a condition that institutions buying the shares should hold them for two years points up the problems created when the government gets involved with commercial companies.

In the run-up to July 1982, the fact that so many shares will be overhanging the market will almost certainly depress the price of the other 50%, most of which are freely traded, making the company more vulnerable to a hostile bidder than it would otherwise have been.

As we said last week, the circumstances in which Ferranti hit trouble were extraordinary, and at any other time, private financial institutions would have been in a position to resolve Ferranti's transient cash problems. Private institutions would never have been able to exact such onerous terms as the government did in return for their help either: it is doubtful that the company would have had to cede more than about 20% of its equity in return for the aid it needed.

The last Tory government imposed similarly artificial terms on the loan to assist with the development of the 2900 series. Until 1984, ICL has either to keep its profits below 7½% of turnover or make repayments on the loan. Clearly the company would be crazy to pay back any money it does not absolutely have to, and the computer business is such that the return on research and development is normally exceptionally good, so any potentially spare profits can be allocated to this.

Nevertheless, it is an artificial constraint deflecting management away from making judgments on pure commercial grounds. Wherever possible, government aid to industry should either be loaned on straight commercial terms, or, where it is regarded as furthering some national interest, given without strings.

Ireland attracts industry

IRELAND'S exceptional success in attracting computer and electronic companies to manufacture there continued unabated in 1979, and the country's Industrial Development Authority says that the arrival of Documation, Data Terminal Systems, Wang and Varian will lead to over 7,000 new jobs for the Republic.

The performance of Ireland's manufacturing industry in 1979 relative to the EEC as a whole is strikingly good: output up 6.8% (all EEC 3%), exports up 12% (EEC 8%) and jobs up 3.7%, whereas they fell in the EEC as a whole by 1.1%.

NatSemi profits

NET profits for this financial year are reported by National Semiconductor to have increased 52.8% from $34.3 million last year to $52.3 million. Turnover for the same period has increased by 36.2% from $719.7 million to $980.4 million.

Microelectronics rates high at GEC

WITH pre-tax profit up 9.7% at £415 million on sales up 20% at £3,006 million, and its cash mountain scarcely diminished by the purchase of A. B. Dick and Avery's, GEC marches relentlessly on.

The cash mountain now stands at £599 million, and despite the divorce from Fairchild, managing director Sir Arnold Weinstock said last week that some of the money would be going into microelectronics.

He explained that the decision to go into the venture with Fairchild was marginal, but seemed a good idea at the time. Now the company has other ideas for developing and manufacturing the specialised circuits that it will need.

He also said that GEC was studying closely the government's proposal for changes in company law which would remove the tax disincentives to floating off parts of the business as separate companies. Some companies within the group, such as the GEC-Schreiber furniture company, clearly do not fit with the mainstream of GEC's business.

Sir Arnold, elevated to the peerage in the Birthday Honours, named electronics, telecommunications, power engineering and industrial products as the most important [illegible] the company's portfolio.

By far the biggest part of the group is now the Electronic Automation and Telecommunications sector, accounting for turnover of £1,042 million, up 20.8% last year, and considerably more profitable than hitherto since profits rose 33.7% to [illegible] million. Overseas subsidiaries also did extremely well, with profits up 30% at £81 million on turnover up 41%.

Computers only one of St Gobain's interests

THE name St-Gobain-Pont-à-Mousson will be turning up with increasing frequency in the computer Press, since the company is in the process of acquiring a controlling 51% stake in Compagnie des Machines Bull, which in turn holds 53% of CII-Honeywell Bull. St-Gobain is also in process of acquiring a 20% stake in Olivetti (CW, July 3) which will pass to Machines Bull.

But what is St-Gobain-Pont-à-Mousson? Usually described as an industrial conglomerate, in British terms it could be thought of as a combination of Pilkington, Rugby Portland Cement and Wimpey. That is actually just the St-Gobain part. Pont-à-Mousson was primarily a steel pipe maker, and the two companies merged in 1970.

It is a £3,500 million company which makes it rather bigger than GEC (£3,000 million last year), and a little smaller than Siemens. It has [illegible] employees, and today its principal interests apart from computer and semiconductor activities just acquired are glass-fibre, float glass, bottles and crockery, building and construction, cement, air conditioning, refuse recycling, [illegible] making and paper.

The new president is [illegible] Fauroux, 53, groomed for stardom by his predecessor, [illegible] Martin, who retired at the beginning of the month. [illegible] had a liberal academic career [illegible] both France and Germany before joining Pont-à-Mousson [illegible] 1961, and also holds a theology degree.

Expansion slows DG growth

STILL hampered by the costs of a substantial expansion of its maintenance and service network in the US, profit growth at Data General remains slow. For the company's third quarter, the 12 weeks to June 7, Data General has reported pre-tax profit up 7.9% at $25.2 million on turnover up 31% at $156 million.

Ex-Exchange Telegraph

FOR Exchange Telegraph [illegible] Extel Group. The company [illegible] which provides news [illegible] services and sells communica[illegible] tions equipment and periph[illegible] is to ask its shareholders [illegible] approve the change of name [illegible] the annual meeting this month.

CW SHARES TABLE

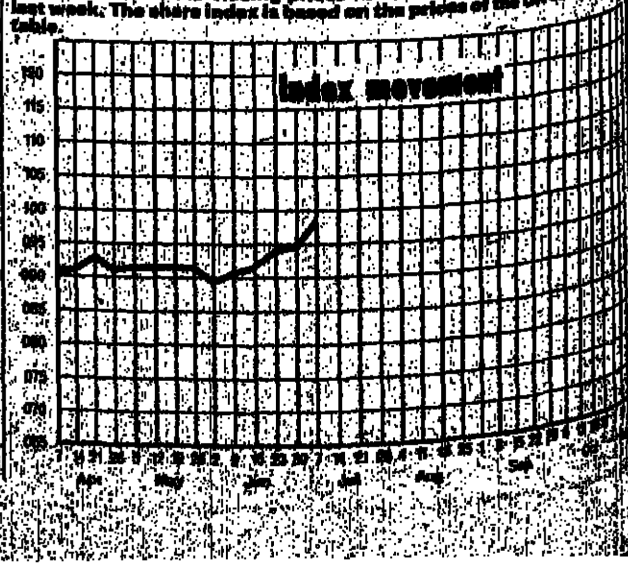
Date: 4/7/80

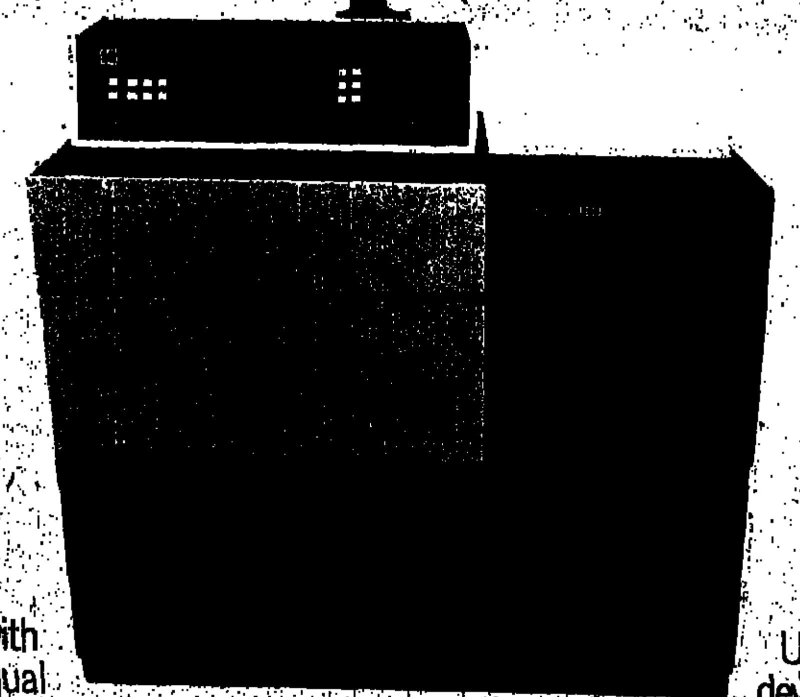
Index: 97.82 Change: +3.45

Pence 1980 High	Pence 1980 Low	London Stock Exchange Stock	Pence Price	Pence C'nge
410	230	A Comp Tech (25p)	410	+5
43	28	B Gov Kent (25p)	29	-1
£37	£28½	Burroughs ($5)	£28¾	-£1¼
78	43	Chloride (25p)	49	+5
120	94	Chubb (20p)	113	+13
100	84	Cole (R.H.) (25p)	88	+4
748	540	De La Rue (25p)	748	+33
180	148	Extel (25p)	162	+8
587	407	Ferranti (50p)	587	+2
428	336	GEC (25p)	428	+24
£43½	£30⅝	Honeywell ($1.50)	£38¼	+£1½
£31	£23	IBM ($1.25)	£28	+£¾
161	115	ICL (25p)	161	+10
78	64	Kalamazoo (10p)	78	+2
246	203	Kode Inter (25p)	236	+7
£28¾	£20⅛	Motorola ($3)	£21¼	+£⅛
210	102	Muirhead (25p)	102	-14
£111	£78	NCR 4% 93/98	£90	+£1
£156	£126	Perkin-Elmer 4%	£156	+£6
410	376	Philips Lamp (Fl 10)	407	+18
191	108	Plessey (50p)	191	+10
266	190	Racal Elect (25p)	262	-4
86	66	Rediffusion (25p)	86	+11
£13½	£10⅞	Rockwell ($1)	£12⅜	+£1
[illegible]	£40⅞	Schlumberger ($1)	[illegible]	-£¼
[illegible]	£19¼	Sperry Corp ($0.50)	£21⅛	+£¾
£21	£16½	TRW Inc ($1.25)	£16⅞	-£¼
334	287	Thorn-EMI (25p)	304	+18
£26¼	£21⅛	Xerox ($1)	£24⅛	+£1

$ 1980 High	$ 1980 Low	New York Stock Exchange Stock
19⅝	14¼	AM International
32⅞	17¼	Ampex
40	33¼	Automatic Data Proc
84	65½	Burroughs
23⅛	16⅝	Computer Sciences
60⅛	45	Control Data
78⅞	55½	Digital Equipment
38⅞	29⅝	Harris
65⅜	53¼	Hewlett-Packard
97⅞	66¼	Honeywell
74½	55¼	Intel
70½	51¼	IBM
15⅞	11½	Memorex
61⅞	42¼	Motorola
28⅝	17¼	National Semi
78⅞	53¼	NCR
49⅝	37	Perkin-Elmer
30½	26	Rockwell Int
125⅞	85	Schlumberger
67⅞	42⅛	Sperry Corp
		Storage Tech
45⅞	29⅝	Tandy
60½	43⅜	[illegible]
104	86⅛	Texas Instruments
43	35	TRW
8½	5¼	Wang
65¼	50⅛	Xerox

The table shows the closing prices in London and New York of the [illegible] last week. The share index is based on the prices of the UK [illegible] table.





PRODUCT NEWS

Low cost keyboard design module

FROM Hi-Tek is a keyboard design based on each key having only a few parts. It can be built to customers' requirements in volume at low cost.

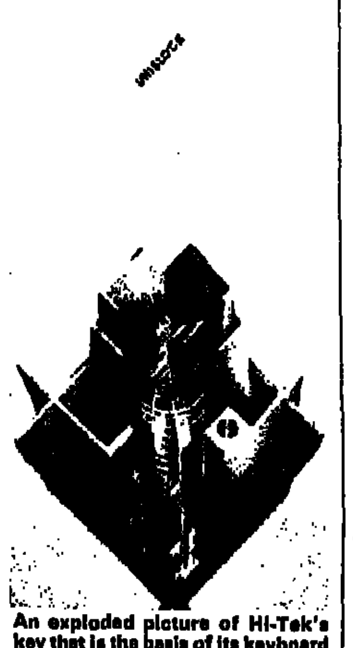
Each key has two cantilevered contacts that are isolated from the key return dynamics. Hi-Tek says this ensures that contact pressure is independent of key operation. An exploded drawing is pictured right.

Each of the two contact arms is cantilevered from the base and inlaid with gold alloy to ensure low electrical resistance, low bounce and long life, says Hi-Tek.

One of the contact arms opens to four fingers to provide a redundant contact system that is said to be more reliable than a single arm contact.

The design of the housing consists of a one-piece moulded key switch array. The design can accommodate optional auxiliary items such as rotary switches and LED stand-offs.

Hi-Tek Corp (CW), 10 Hope Drive, The Park, Nottingham. Tel: 0602 42444.



An exploded picture of Hi-Tek's key that is the basis of its keyboard design. It can be tailored to the user's requirements.

Distributor named

DOUBLE-sided floppy disc manufacturer Tandon Magnetics has appointed Hal Computers as its UK OEM distributor.

Hal Computers Ltd (CW), 133 Woodham Lane, New Haw, Weybridge, KT15 3NJ. Tel: Weybridge (97) 48346.

Shugart compatible floppy disc drive

A 5¼-inch floppy disc drive which is compatible with the Shugart SA 400 has been announced by Tekdata Electronics.

Designated FD 50A, the main feature of the drive is its use of a brushless motor which runs continuously. This eliminates start-up time, faster motor rotation and direct search, says Tekdata. Track to track access time is quoted at under 25 milliseconds while average access time for 35 tracks is under 298 milliseconds.

The drive is made by Teac and the FD 50A has a capacity of 109.4K-bytes unformatted. This may be increased to 125K-bytes by addressing an additional five tracks.

Up to four drives can be daisy-chained to a single controller. With soft sector formatting and using the extended track option a total of 368.8K-bytes can be achieved.

Other facilities include write protection, a stepper motor for positioning the read/write head and controls to prevent corruption of data due to erratic power supplies or power up or power down.

Tekdata Electronics (CW), Unit 1, Federation Road, Burslem, Stoke-on-Trent. Tel: 0782 813631.

Ten megabyte cartridge for S-100 based micros

A TEN megabyte cartridge disc drive for S-100 based microprocessor systems that incorporates five megabytes of fixed disc and five megabytes of removable disc storage is available from Equinox Computer Systems.

Equinox says that the drive, called KB10, runs about 10 times faster than floppies on SEEK operations and requires no additional means of back-up.

The KB10 will support CP/M 2.0, MP/M, Famos and Omnix operating systems. Its controller will operate with up to four 2,200 bpi drives. Data transfer rates of 310K-bytes per second may be overlapped with SEEK operations on other drives, says Equinox.

The KB10 controller and drive enclosure measures 11.75 x 20 x 28 inches and has a teak finish. It can be used on a desk top and no additional power supplies are needed to run the system.

Equinox Computer Systems Ltd (CW), 16 Anning Street, New Inn Yard, London, EC2 3HB. Tel: 01-739 2387.

Catalogue

SUHNER Electronics has published a new catalogue called "Fiberoptic" which gives details of its range.

Suhner Electronics Ltd (CW), Telford Road, Bicester, OX6 OLA. Tel: 08692 44676.

Borer 1,200 bps modem

BORER'S 1,200 bits per second modem can operate in synchronous or asynchronous mode and provide a full duplex communications path over a single two wire dial-up link. It has been approved to be used over Post Office lines.

Called the 1212, Borer says the modem can give up to a fourfold improvement in transmission speed which also means lower telephone charges. It also conforms to the Bell 1212 modulation technique.

Borer adds that the 1212 can also be used on leased lines and incorporates the switching for dial back-up and auto answering facilities.

The modem also has interface status displays as well as local and remote diagnostic facilities via hardware switches on the front panel which can be used in connection with a video terminal.

Borer Electronics Ltd (CW), Fishponds Close, Wokingham, RG11 2QL. Tel: 0734 783372.

300bps full duplex single card modem

A SINGLE card modem that transmits and receives data in full duplex mode at up to 300 bps over telephone lines or two wire leased lines has been introduced by Bootstrap of Blackrock, Co Dublin.

Made to meet CCITT V21 specifications, the modem is available in three versions: table top, 19-inch rack mounting or single card.

The table top model measures 24 x 29 x 6 centimetres and is housed in a steel chassis which acts as a shield against interference.

The 19 inch rack mounting version is intended for installation in computer centres, occupies five rack height units (22 centimetres) and can hold up to 16 modem cards.

The single card version is suited for building into terminals and other portable equipment, says Bootstrap. The card is under 2.5 centimetres high and contains the complete modem.

The modem accepts serial asynchronous data via the standard V24 (RS 232C) interface through a 25 pin female D-type socket. It will operate with a minimum of three connections: transmit data (pin 2), receive data (pin 3) and signal ground (pin 7). However, it can also be controlled by the data terminal ready signal (pin 20) if required.

LEDs on the front of the modem show the status of the V24 signals.

Modulation is accomplished by frequency shift keying (FSK). The frequencies — 980 to 1,180 Hz and 1,650 to 1,850 Hz — are crystal controlled.

Bootstrap Ltd (CW), 9 Georges Avenue, Blackrock, Co Dublin, Eire. Tel: (0001) 887892.

Preparing NC tapes

A SYSTEM called Tapeprep for preparing tapes for numerically controlled machines, based on the Commodore Pet, has been launched by Taylor Wilson of Dorridge, West Midlands.

Up to 400 NC programs can be stored in the system which has keyboard, screen, 32K RAM, 24K of operating system, a Basic interpreter, fast printer, paper tape station and a dual floppy disc drive with up to 800K of online storage.

It costs £3,850 and two versions of Tapeprep are available for NC applications, which costs £100, and for CNC applications, which costs £200.

Taylor Wilson says it can also supply packages for payroll, stock control, sales and purchase ledger.

Taylor Wilson Systems Ltd (CW), Oakfield House, Station Road, Dorridge, B93 8HQ. Tel: Knowle (05645) 6192.

Leaflet

FROM Business Aids is a full colour leaflet on its high capacity shredder for use in larger offices, computer installations and semi-industrial applications.

Business Aids Ltd (CW), 3 Whitby Avenue, London NW10 7SQ.

[illegible]

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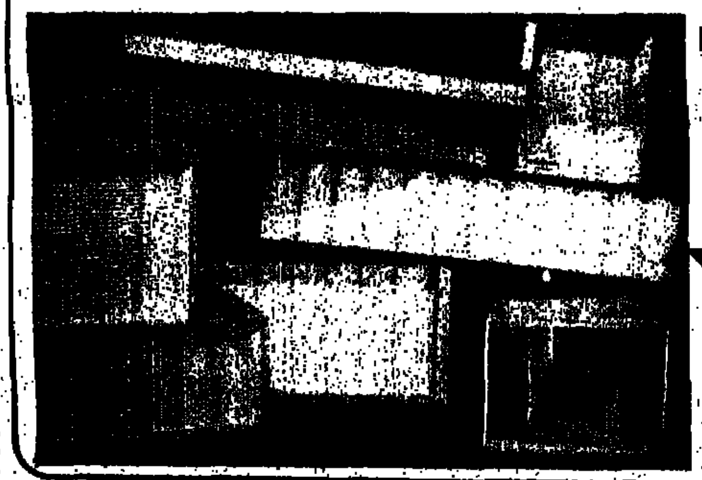

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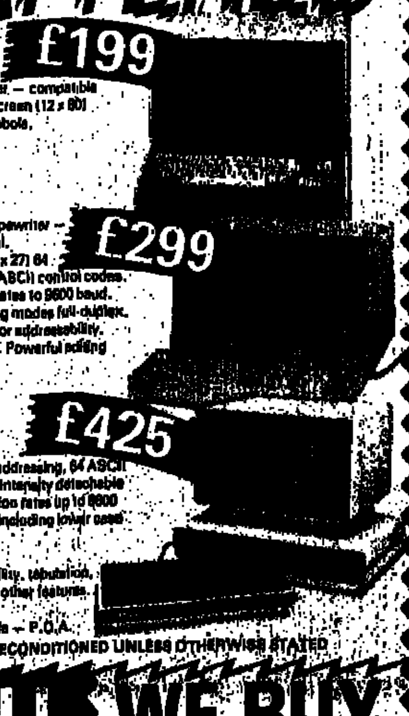

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Texas bid to cut software costs

TO overcome the burden of rising costs of software and programming for microcomputers, Texas Instruments is following a similar path to that taken by Intel (CW, June 19) and developing firmware modules.

The next product group is to be called the Component Software Series with the first two units in the range being pre-programmed to run on the 9900, 16-bit microprocessor family, and 990 microcomputer modules.

The first device is a Realtime Executive which is the key element in the group, designed to provide a software equivalent to a system's hardware bus. TI plans to make it possible to connect other modules in the Component Software group to this bus.

Second in the group, a file manager, is already available. It is device-independent requiring only minor modifications to enable it to run with either a floppy disc controller, or a bubble memory controller.

Like Intel's products, TI's file manager comprises a series of interconnecting modules which can be linked in various combinations depending on the type of application. The modules range from memory addressing to file creation and management capabilities.

Next addition to the range, a data communications product, should be available later this year. TI hopes to produce about 40 to 50 Software Components over the next five years, but initially some will be loaded on floppy discs rather than in chip form.

Both Intel and TI moves to develop their own firmware modules threaten to lock users into the respective company's software, as users of IBM's large systems are locked into IBM software.

Telecomm users 'have little influence'

USERS have little chance of influencing British Telecom policy, because the bodies which present their views are amateurish and ineffective. This is the opinion of the Telecommunications Users' Association put forward in a report to Industry Minister Sir Keith Joseph.

Improved means of control will still be necessary after the government's proposed relaxation of the telecommunications monopoly, in the association's view, because British Telecom will still be a monopoly in the terms of the Fair Trading Act by its size alone as well as because it will almost certainly have to retain the monopoly of the network itself.

The 25 page report says that even the Post Office Users National Council is unable to affect British Telecom's long term strategies.

The forthcoming legislation on telecommunications administration should require British Telecom's targets and results to be published in a full and consistent way, the report says, and should aim to set up user representation which is inexpensive, professional and has specified powers.

The council says that, as a result of its report to the DoI in December, it has begun regular consultations on long term pricing strategy with senior management at British Telecom.

British Telecom says that the quarterly information called for by the association on profit or loss and service performance is already published.

The association was formed in April.

Robots take over in the motor industry

by Nick Enticknap

ROBOTS are beginning to make their presence felt, most publicly in the motor industry. Advertisements tell us that they hand build Fiats; not to be outdone, British Leyland will be using 30 of them to produce the new Mini Metro.

The government has woken up to the potential of robots, and has allocated a sum of money which has variously been reported but is in fact £442,000 over three years (CW, October 18, 1979). It is being used to provide a robot advisory service to industry.

The service is sponsored by the Department of Industry and run by the Production Engineering Research Association. It is being directed by Professor Wilfred Heginbotham, who has been involved with robots and robotic machines for 20 years. He founded and ran the Wolfson Industrial Automation Group at Nottingham University before moving to Pera's headquarters at nearby Melton Mowbray, as director general.

The main reason for using a robot is to save on labour costs. This, says Professor Heginbotham, is less compelling in the UK than elsewhere because of the comparatively low cost of labour. "It can be difficult to justify on direct economic grounds the spending of £25,000 to £35,000 to replace half a man, which is what it means very often". Robots range in price from £15,000 to £45,000.

Practically all robots are made abroad — the only UK manufacturer is Douglas Hall. This means that "we are buying them in from high labour cost countries to work in a low labour cost economy," which, he says, is all wrong; it should be the other way round.

The effect of this is to make the UK comparatively backward in robot usage. There are about 200 robots in the UK, of which about 150 are working, the rest being used for demonstrations and research. This compares with totals of 4,000 in Japan, 3,000 in the US, 700 in West Germany and about 450 in Italy.

The government grant will be used by Pera partly to acquire equipment, partly to develop display systems and partly to provide advice to industry.

Four specialist staff — a manager, an electronics designer, a mechanical designer and a project engineer — have been recruited from the Nottingham University Wolfson Group to support the service.

The service will also be supported by a robot demonstration area which will enable industry executives to assess the capability of various robots. Pera hopes to acquire robots from a number of different manufacturers, and negotiations are taking place; it has already obtained two manufactered by the Swedish firm Asea, the IRb-6 and IRb-60, and two from Hall, a Ramp and a Little Giant.

The Robot Advisory Service started operation in January. Any company which feels that robots could be useful to them can take advantage of the service; on contacting Pera, it will be assigned a free day's visit by by one of the specialists to examine the situation.

A questionnaire has been formulated by Pera to ensure that the day's visit is productive — it is given to the client beforehand. It asks questions such as the reason for requiring a robot, the cost justification, the nature of the job in mind, and so on.

At the end of the day's visit, agreement is reached on what further action should take place. It might be decided that the use of a robot in a particular application is not appropriate (just as systems analysts will sometimes conclude that use of a computer is not justified). In such a case the client might well be referred to some other part of Pera, such as the automation section.

Should the results of the initial assessment suggest that a robot would be useful, the Pera specialist will then prepare terms of reference covering the further investigation necessary. Under the terms of the government funding, the client is entitled to a subsidy covering the cost of the first 15 man days of further effort.

According to Gordon Wakefield, the mechanical engineer assigned to the project, the questions people ask can be basically boiled down to two; will the robot handle the part, and will it do it in a time which is competitive?

It is at this stage that the demonstration area will come in useful; clients can see for themselves what is possible and what is not.

However it is impracticable for Pera to acquire a model of every one of the 40 or so robots on the market, and it is quite possible that the most appropriate robot for a particular job will not be available.

To overcome this, Pera is concerned with the further development of a clever computer graphics system which permits the live simulation of robot applications.

This is a continuation of work started off by Professor Heginbotham and his team at Nottingham University, based on the Sammie system developed by M. C. Bonney of the university's production engineering department. In fact at present Pera is still using the Nottingham facility.

The association plans to have a similar facility at Melton Mowbray eventually, based on a Prime 400 mini and using an Imlac refresh graphics display.

The graphics system is equipped with a database specifying the performance characteristics of each type of proprietary robot known to Pera. It permits users to construct an environment consisting of pallets, conveyor belts and other production engineering components, and to see how particular robots perform in it.

The system permits the display of both linear movement and rotation, and as well as showing whether a robot is capable of performing the defined task; it also calculates the time taken.

Pera has, at present, two staff who are available to undertake implementation, or to play any further part that the customer might desire, including estimating costs.

The Robot Advisory Service has received a very enthusiastic response, says Professor Heginbotham. After the first three months about 50 visits had been made, and there was a backlog of 70 inquiries awaiting attention.

Applications are restricted by the state of the art. Robots are programmed to perform specific tasks, and can be reprogrammed as required, but generally are not capable of responding to changes in their environment in any more flexible way than either doing or not doing.

Potential applications discussed so far have nonetheless covered a very wide field. They include polishing joints used in artificial hips, picking lettuce, producing industrial and surgical gloves and making furniture as well as more mundane tasks such as machine operations, casting, forging and pressing.

The videodisc and the electronic office of the future

In the first of two articles, MIKE ROBSON, a senior consultant with Pactel, describes the implications of the videodisc for the electronic office. In Part Two the application of digital discs to the office environment will be considered.

VIDEODISC players currently on sale in the US are directed at the home entertainment market and, in their present form, are not suitable for office automation. However, new systems under development and now emerging on the market will provide low-cost, high-density digital storage with rapid random access.

These devices could make the electronic filing cabinet a reality within three years and significantly accelerate the trend towards the integrated electronic office.

The videodisc heralds a major step in storage technology. It permits information to be stored and quickly retrieved more cheaply than ever before. The storage capacity of digital products already in the pipeline is impressive: a single disc can store approximately 10 billion bits of information. In computer parlance this is 1,000 megabytes of online data storage.

For a text processing system it is approximately 100,000 A4 pages — equivalent to the output of a three-girl typing pool for over three years. Little is yet known about the prices for the digital systems.

One analyst is already forecasting that 25%-30% of homes will have videodisc players for TV or music by 1990. Others argue that in monetary terms the professional digital market will be bigger than the domestic one. Either way, videodisc systems will be one of the major growth markets of the 1980s.

Not surprisingly, there are some 40 manufacturers developing videodisc equipment. They are a mixture of TV set makers (spurred on by sluggish sales of colour TVs), film and television network companies (wishing to sell old movies and programmes) and computer and office systems suppliers.

Fingers have already been burnt and a complex distribution structure is emerging which involves many joint ventures and cross licensing agreements. Notable among the more active of the contenders are MCA, IBM and RCA in the US, Philips in Europe and JVC and Sony in Japan.

What is a videodisc? Standard videodiscs, resemble long-playing gramophone records in appearance and size. They are pre-recorded in the factory or studio and, when inserted in a player and connected to a TV set, enable the viewer to see the recorded film or programme. This type of player currently sells for between $400 and $800, with discs themselves costing between $5 and $20 depending on recorded material.

The principle of recording television pictures is not new and was first demonstrated by J. L. Baird, the inventor of television, in the early 1930s. In more recent times several different methods have been adopted to record video information, but optical systems using laser light have emerged as one of the most promising technologies to date.

The Philips Video Long Playing system is an example of the state of the art. Information is put on the disc in the form of a continuous spiral, which consists of a closely spaced series of minute pits of varying length and spacing. The secret of the high density is that the pits are made on the master recording using a low-power laser. The laser can be focused to a diameter of 1 micron (one millionth of a metre) which permits a track spacing of 60 times greater density than an audio LP record.

On a standard 30 cm (12 in) disc there are more than 50,000 tracks of information. Each track represents one TV picture frame, so there are over 50,000 separate pictures on each side of the disc giving approximately 30 minutes of viewing time per side.

The Philips system consists of a mechanism about the size of a hi-fi amplifier on which the videodisc is rotated at 1,500 rpm. To play back the disc, a laser is focused on the underside using an optical lens system. Where the surface has no pit the light beam is reflected back through a series of mirrors onto a photodiode.

When a pit passes the beam, the laser light is diffracted and gives a modulation to the signed output. The signal can then be fed to the aerial socket of a television in the normal way. Freeze-frame and slow motion effects can be obtained by holding the head over a single track and jumping tracks.

On the MCA Discovision system each track is numbered and any frame can be located with an average access time of 2.5 seconds by keying in the frame number on a hand-held keypad.

An important feature of optical systems is that the head is not in contact with the disc and so does not wear.

In addition to having their sights on the "electronic home", videodisc suppliers are looking to the educational and industrial markets where video instruction is one potential application area. The videodisc could have an impact on the market for video cassette recorders. Suppliers of these are pushing ahead with longer playing times, and claim they will coexist with videodiscs because the former are mainly used for off-the-air programme recording.

The systems described above have limited application within the office. What is needed is a digital version with faster random access read/write facilities and a more rigorous duty cycle.

What are loosely being called digital videodiscs are not videodiscs at all, as they are not used to drive television pictures. Philips, for example, prefers to call them digital optical recorders but that is not appropriate to manufacturers using non-laser techniques. Although not truly descriptive, the term DRAW (Digital Read After Write) disc is emerging as a front-runner.

To add further to the confusion, optical audio mini-discs are expected on the market soon to provide "super hi fi" digital sound recordings.

Several manufacturers are understood to be interested in the digital or professional market including MCA, the Digital Recording Corp, Philips, Toshiba and IBM. DRAW discs can be expected on the market in a year or so.

In the Philips system, each circle (near circle) or track of information is divided into 128 sectors, each of which can be addressed. The laser head is mounted on a radial arm and moved by a small servo-controlled linear motor. Positioning is done by counting the number of tracks passing the head rather than by absolute positioning. Average access time is 250 msecs.

On the assumption that packing densities are comparable with existing products, ie 10 billion bit capacity, a 30 cm DRAW disc could store the equivalent of 1,000 megabytes of hard disc, or seven magnetic tape reels, or 100 microfiche, or 100,000 A4 binary coded pages, or 10,000 A4 page images.

Whereas these storage capacities are impressive, it should be remembered that user-writeable DRAW disc units, when available, might reasonably be 10 times the price (and possibly more) of the current domestic videodisc players.

The $64,000 question remains "Will the technologists produce a rewriteable version?"

For the moment at least it is assumed that the digital versions will be user-writeable — but only once. Suppliers argue that the capacities are so high that the user can afford to rewrite a new version of a record or document where update is required. This would increase the complexity of the file management software.

Unless elegant solutions can be found to this problem, this could add considerably to the cost of DRAW systems and limit their application to "slowly dynamic" information.

The Philips video long-player system.

Why a secret computer room is permanently empty

by
Nicholas
Enticknap

DO you know what to do if your installation is put out of action by a fire, explosion or act of God? What back-up plans do you have? Can the firm down the road give the machine time you require?

The answer to these questions in many cases is "Don't know." Nicholas Enticknap was given a tour of a secret installation in the North West that doesn't have a computer but can be used to accommodate members of the "club" which financed it should a major tragedy hit their installations.

Enticknap also reports on the planning, finding and fitting out of the installation.

SOMEWHERE in the North-West (I am not at liberty to disclose precisely where) there is a computer room with a difference. Though fully equipped with air-conditioning equipment, burglar alarms, fire detection systems and the necessary wiring for telecommunications work, it lacks the one thing you would think a computer room would always have, to wit a computer.

Furthermore, it is the earnest wish of the people who own it that it never will, and that it will carry on in its present silent and deserted state in perpetuity. This somewhat surrealistic state of affairs represents sound commonsense and practical planning; it is the solution for five large organisations to the considerable problem of how to cope with disaster.

Increasingly today computer systems lie at the heart of a company's operations, to the extent that it would be impossible to run the business without them. This could mean that a disaster such as a fire or an explosion could well leave the company in ruins.

The Fire Protection Association has calculated that, of the fires that have happened in computer rooms in this country, 95% were started accidentally. Insurance is of course a partial protection, but it does not cover the costs of taking emergency measures, nor of the more or less incalculable inconsequential losses that follow.

In a real sense the organisation of the standby facility can be seen therefore as a substitute for insurance, a small outlay to ward off the possibility of the company being damaged beyond repair.

Computer manufacturers are well aware of this danger and will in most cases supply replacement systems more or less immediately. That, however, is not a lot of help if you've got nowhere to put the kit. And for modern complex computer systems supporting communications networks, any old spare office will not do.

There are commercial organisations marketing standby facilities, but for a variety of reasons they may not be suitable, if only for the simple one, which applied in this case, of geographical location.

So the five organisations involved (again, for security reasons, I cannot reveal their identity) decided to take the unique step of organising such a facility themselves. As you would expect, the first step was a feasibility study; this was funded half by the users and half by the National Computing Centre, which will be publishing the results shortly.

Deciding to organise a standby facility is one thing; actually doing it another, as the study showed. A whole range of decision had to be thought through, and a vast number of minutiae attended to, before the goal was reached.

With the best will in the world, the DPM is not going to be able to make all the necessary decisions on the spot; there will simply be too many of them and the pressure on him will be too great. And apart from that, he will be needed to liaise with other executives about the measures being taken. He may also have other corporate responsibilities which have to be attended to.

Two things therefore became clear. First, as much planning as possible should be done before the event; each member of the scheme accordingly prepared a detailed contingency plan. Secondly, some third party would be required to run the facility, and put these plans into practice when necessary. This changed the concept from a standby facility into a standby service.

The next problem was the organisation of the scheme. Various arrangements were considered, and it was finally decided that the five bodies set up a separate company limited by guarantees. In this arrangement, each participating member appoints a director to the board, and takes out a comprehensive subscription agreement specifying the rights, privileges and obligations of membership.

The big advantage of such a scheme is that the participating organisations are directly involved in decision-making, and so have control over the level and cost of the service. The newly formed company, called Crinder Ltd, was formally constituted last November.

Below the policy level, the management of the facilities has been contracted out to consultancy Master Resources Ltd (MRL) of Wilmslow. The MRL executive is Ray Ellison, who was until recently the National Computing Centre's best-known security consultant.

Once the nature and the organisation of the service had been finalised, it remained to find suitable premises. Building a computer room from scratch would have been prohibitively expensive, so the company looked around either for a building which could readily be converted, or for an existing computer room which was no longer required. City centres were ruled out, because of the problems of transport and parking, and also because the rents would be higher than elsewhere.

The company eventually found a disused computer room which met the basic requirements at a suitable site with good motorway access. Some work needed to be done, particularly the installation of fire protection equipment, extra air-conditioning equipment, and power distribution equipment suitable for the computer systems owned by the participating companies, and telephone facilities for 60 incoming data communications lines.

Telecommunications proved one of the major problem areas and to ensure that the right steps were taken Crinder formed a special sub-committee. This has made it easier to discuss issues with the Post Office which prefers to deal with a collectively agreed approach.

Crinder pays tribute to the Post Office for its co-operative attitude. For example, the corporation has indicated its willingness to relax its rules for a limited period during an emergency, by permitting the connection of private modems.

The modifications have now been completed and the room is ready for use when needed. Hopefully it never will be. But if the balloon does go up, Ray Ellison will go to his filing cabinet for the contingency plan of the affiliated organisation and proceed to put it immediately into effect.

The whole scheme has worked out remarkably economically for its members. They have all paid a joining fee of £3,200, which covered the cost of drawing up the contingency plan, and are charged an annual fee of £5,200, to pay for the running of the centre. Should the room be used at any time, the member concerned will take over all the costs of the operation for the duration.

Rules of the ‘clu

THERE is always the temptation, with the computer room sitting there empty but being paid for, to make use of it for other purposes than coping with a disaster, for example when replacing one computer system with another.

Once again the constitution shows its worth: any such case would be considered by all the participating members and decided jointly.

One circumstance where use of the room has been specifically ruled out is industrial action. This would be regarded as a problem internal to the organisation, rather than a natural disaster; but the important point is that use of the centre as a strike-breaking tactic would almost certainly produce undesirable consequences which would adversely affect the members of the scheme.

Membership is not confined to the existing participants. Any organisation in the North West may apply, and it would be up to the existing members to decide whether to admit the applicant.

The expectation is that there will eventually be about [illegible] members; once that number is reached the probability of two members having a disaster at the same time is reckoned to be too great, and the acquisition of a second centre will be considered.

Apart from welcoming new members, Crinder will also advise organisations in other parts of the country which wish to set up a similar facility. Contact should be made, in the first instance, with MRL at Wilmslow.

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(DR/1617) 12+ months COBOL	5500	4
(DR/1618) 2+ years COBOL	6500	5
(DR/1619) 3+ years COBOL	7000	4
(DR/1620) 4+ yrs (seniors) COBOL	7500	3

Contact Cathy Scott

CHESHIRE

ANALYSTS

	£	No. of vacancies
(DR/1621) 12+ mths commercial	6250	4
(DR/1622) 18+ mths financial	6500	4
(DR/1623) 2+ years production	7000	5
(DR/1024) 2+ years commercial	7500	4

PROGRAMMERS

	£	No. of vacancies
(DR/1625) 12+ months COBOL	5800	5
(DR/1626) 2+ years COBOL	6500	5
(DR/1627) 3+ years COBOL	7000	6
(DR/1628) 4+ years COBOL	8000	6

Contact Cathy Scott

LANCASHIRE

ANALYSTS

	£	No. of vacancies
(DR/1629) 6+ mths commercial	5000	3
(DR/1630) 18+ mths financial	6500	4
(DR/1631) 2+ yrs manufacturing	7000	4
(DR/1632) 3+ years commercial	8000	4

PROGRAMMERS

	£	No. of vacancies
(DR/1633) 12+ months COBOL	5500	3
(DR/1634) 18+ months COBOL	6250	5
(DR/1635) 2+ years COBOL	6700	5
(DR/1636) 3+ years COBOL	7200	5

Contact Cathy Scott

MERSEYSIDE

ANALYSTS

	£	No. of vacancies
(DR/1637) 12+ mths commercial	6000	6
(DR/1638) 2+ years production	6700	4
(DR/1639) 3+ years financial	7200	5
(DR/1640) 4+ years (seniors)	8250	3

PROGRAMMERS

	£	No. of vacancies
(DR/1641) 18+ months COBOL	6500	7
(DR/1642) 18+ months IBM ASSEMBLER	7000	3
(DR/1643) 3+ years COBOL	7250	6
(DR/1644) 4+ years (seniors) COBOL	7800	4

Contact Cathy Scott

YORKSHIRE

ANALYSTS

	£	No. of vacancies
(DR/1645) 12+ mths financial	6500	6
(DR/1646) 18+ months retail	6800	5
(DR/1647) 2+ years stock control	7250	5
(DR/1648) 3+ years commercial	7750	4

PROGRAMMERS

	£	No. of vacancies
(DR/1649) 12+ months COBOL	6000	8
(DR/1650) 2+ years COBOL	6400	6
(DR/1651) 3+ years COBOL	6800	6
(DR/1652) 4+ yrs (seniors) COBOL	7200	5

Contact Cathy Scott

HUMBERSIDE

ANALYSTS

	£	No. of vacancies
(DR/1653) 18+ mths financial	6300	3
(DR/1654) 2+ yrs commercial	6600	3
(DR/1655) 3+ yrs manufacturing	7250	2
(DR/1656) 4+ yrs commercial	7750	2

PROGRAMMERS

	£	No. of vacancies
(DR/1657) 12+ months COBOL	5250	3
(DR/1658) 18+ months IBM ASSEMBLER	6250	2
(DR/1659) 2+ years COBOL	6500	2
(DR/1660) 3+ years COBOL	7000	2

Contact Roy Drury

WEST MIDLANDS

ANALYSTS

	£	No. of vacancies
(DR/1661) 12+ mths commercial	6200	6
(DR/1662) 2+ yrs manufacturing	6800	5
(DR/1663) 3+ years financial	7300	5
(DR/1664) 4+ years (seniors)	8200	3

PROGRAMMERS

	£	No. of vacancies
(DR/1665) 12+ months COBOL	5250	14
(DR/1666) 2+ years COBOL	6300	12
(DR/1667) 3+ years COBOL	7000	12
(DR/1668) 4+ yrs (seniors) COBOL	7800	4

Contact Susan Stuart

EAST MIDLANDS

ANALYSTS

	£	No. of vacancies
(DR/1669) 12+ mths financial	6300	5
(DR/1670) 2+ yrs stock control	6700	5
(DR/1671) 3+ years commercial	7500	6
(DR/1672) 4+ years (seniors)	8200	4

PROGRAMMERS

	£	No. of vacancies
(DR/1673) 6+ months COBOL	4800	8
(DR/1674) 18+ months COBOL	6000	7
(DR/1675) 3+ years COBOL	6600	7
(DR/1676) 4+ years (seniors) COBOL	7250	6

Contact Susan Stuart

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ANALYSTS

	£	No. of vacancies
(DR/1677) 12+ months financial	6500	2
(DR/1678) 18+ months commercial	7000	3
(DR/1679) 2+ years financial	7500	2
(DR/1680) 3+ years commercial IBM	8500	2

PROGRAMMERS

	£	No. of vacancies
(DR/1681) 12+ months COBOL	5500	2
(DR/1682) 12+ months PL/1	6250	2
(DR/1683) 2+ years COBOL	6500	3
(DR/1684) 3+ years systems programmers IBM	7000	2

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(1956)

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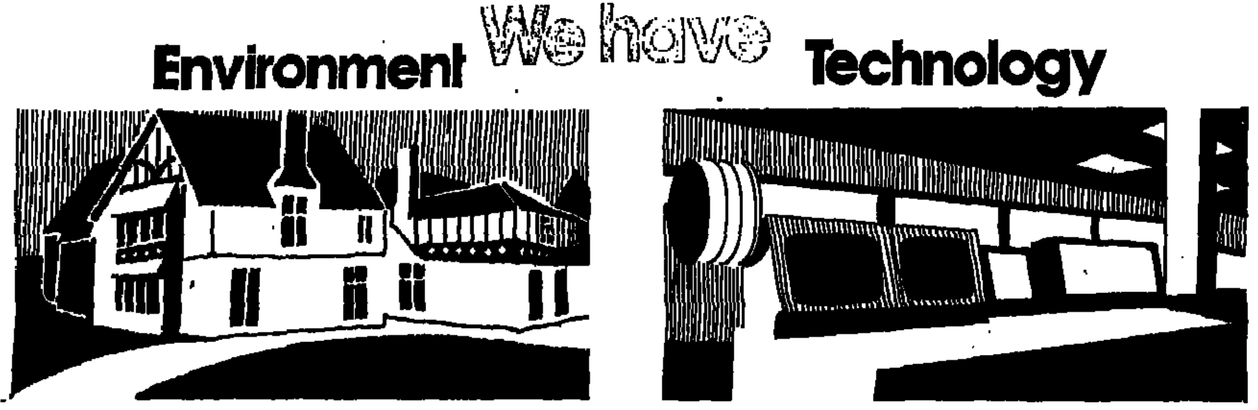

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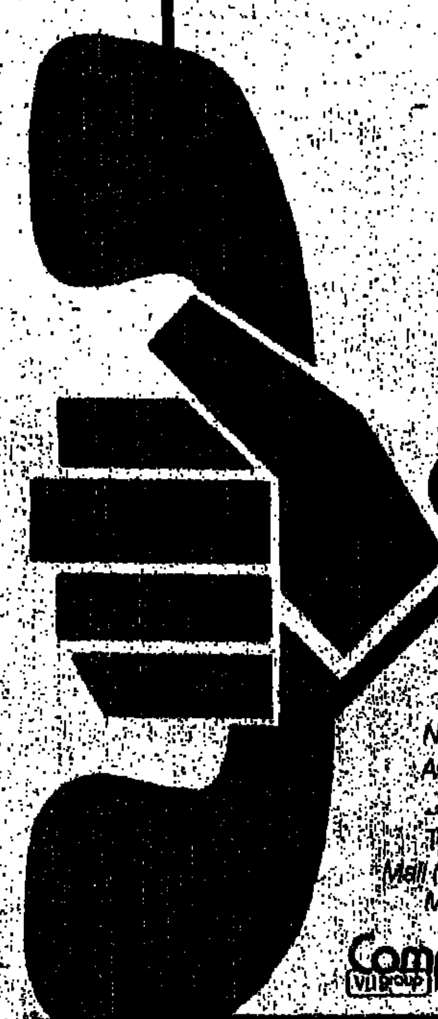

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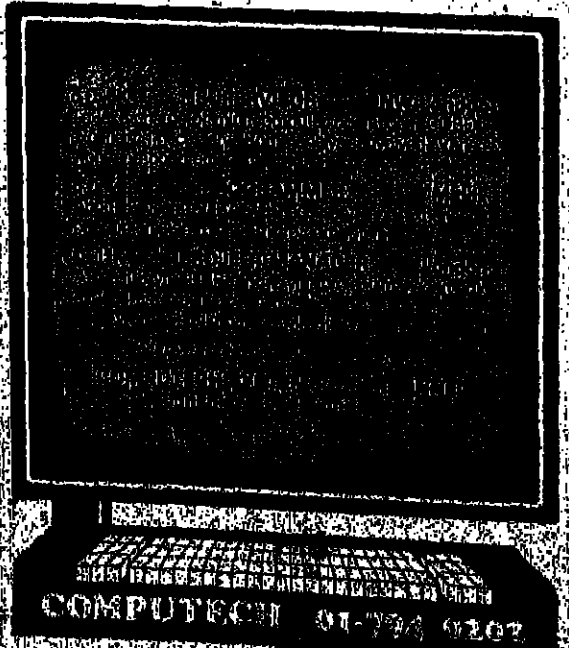

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COMPANY CAR + BENEFITS
AND
A TRULY REMARKABLE
AND
MARKETABLE CONCEPT

SCR have been retained to identify two very rare people. Rare because they will not only have a production engineering background and a good understanding of computerised numerical control, but will be knowledgeable in business systems including sales order processing, stock control, bill of materials and financial applications.

We turnover £2 million so we are not over-sized but personal. Apart from a healthy profit ratio we have the security of being a division of a £300 million per annum International Company.

Founded four years ago, we are dedicated to supplying fully supported turnkey systems to the manufacturing industry, where apart from being able to improve their information systems (a lot of Companies can do that), we have the ability to dramatically enhance their tooling design operation by applying G.N.C, thus positively effecting the origin of a Company's profitability; the products they manufacture and ultimately sell.

Based in a Manor House, with 4½ acres of ground and offering outstanding staff facilities, we are looking for two Sales Engineers to cover the South East, Midlands and Northern areas. Consideration will be given to candidates living in most parts of the Country.

We feel this is a rare opportunity for someone to join a young and dynamic Company where creativity and job satisfaction are but two of the benefits waiting for the right applicants.

For an immediate and confidential interview contact our Advising Consultant, **Simon Lever** on **021 236 3781** (24 hour answering service) or 021 420 1574 (evenings and weekends).

Applications will be treated in the strictest confidence.

SCR

London 01-935 0671 3 Mandeville Place, Wigmore Street, London W1M 5LB
Birmingham 021-236 3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY
Manchester 061-833 0427 Blackfriars House, The Parsonage, Manchester M3 2JA
Brussels 010 322-640 7161/71 Avenue Louise 327, Boite 4, 1050 Bruxelles

Specialist Computer Recruitment Ltd

Computing Services Association

(1841)

RPG2 or Cobol Programmers to £7,500

[illegible]

GLOUCESTERSHIRE

Applications are invited from experienced RPG2 programmers (or people with COBOL who are willing to retrain) for positions in our client's new DP department, involving the development of several on-line commercial systems on IBM System 34 hardware. Successful applicants will work in an extremely friendly atmosphere and modern office environment, with a company who have a proven record of success and growth in the insurance industry.

Other benefits in this employment include NON-CONTRIBUTORY PENSION SCHEME, FREE LIFE ASSURANCE, SUBSIDISED LUNCHES and a GENEROUS RELOCATION PACKAGE.

For full details, telephone Digby Dyke on 021 643 8501 by transfer charge call, or write to him at the address below, quoting reference no. DD/R68/CW10/07.

Computer People
Midlands

Alpha Tower
Birmingham B1 1[illegible]
021 643 2317

Computing Services Association Recruiting Consultants VLgroup

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Staffordshire County Council
Highways Department

COMPUTER SYSTEMS ANALYST/PROGRAMMER

for Technical Systems

Post No. 22-01-156 Computer Section

£5,268 - £7,077 per annum

Commencing salary according to age and experience

Applications are invited from suitable persons having appropriate qualification and practical experience of FORTRAN — additional experience in PL/1, BASIC and/or Assembler and knowledge of highways engineering would be an advantage.

The successful applicant will work on technical systems using the County Council IBM 370/148 computer working under VM/CMS, also designing systems, writing and documenting programmes which form a vital part of the work in addition to giving day-to-day assistance to end users.

Two V.D.U. terminals are currently available for programme development and running "live jobs". Other equipment in use comprises a Calcomp digital graphplotter and programmable calculator.

A further two V.D.U.s will be installed during 1980.

Closing date: 4th August, 1980.

This post is open to men and women.

Removal expenses, lodging allowances and car user allowances may be granted in approved cases.

Application forms may be obtained from the County Surveyor, Tipping Street, Stafford ST16 2LP.

County Treasurer's Department

Systems Analyst/ Programmer

Salary £3990-£7077

With systems and COBOL experience to join a Project Team. Applicants should preferably have experience in communication, prefer to supplement the skills of an established team. We have a Honeywell 66/10 using GCOS and DM IV, and are extending communication facilities and establishing use of database (IDS 11). The post offers variety and challenge, with pleasant working conditions and flexitime.

Starting salary according to qualifications and experience.

Further details can be obtained from Mr. H. Bean, Head of Computer Division, telephone Bedford 63222.

Application forms obtainable from the Personnel Officer, County Hall, Bedford. Telephone Bedford 63222 Ext. 107.

Bedfordshire
COUNTY COUNCIL

(1823)

Data Processing Manager

Airport Services
*Based in West London
*Company Car

This steadily expanding Division of the world-wide THF Group serves Airlines and Airports throughout the U.K. and in Europe; activities include Airport Restaurants, Duty-Free Shops and International Airline Catering.

It now seeks a Data Processing Manager to head up and co-ordinate its diverse D.P. operations. These include in-house minicomputers, RJE to IBM 3033's, Point-of-Sale and sophisticated Data Entry Equipment.

He/she will be responsible for improving the efficiency and effectiveness of day-to-day operations and for planning future D.P. development. Broad policy guidelines for this have been laid down by the Group.

The post will be based in West London, but there will be a need to travel and for this purpose a company car is provided.

We offer a good salary, large company benefits and excellent prospects.

Please apply, giving details of qualifications, experience, age and current salary to: Colin Forbes, Group Personnel Manager, Trusthouse Forte Limited, 7 Hanover Square, London W1R 0PS.

thf

TRUSTHOUSE FORTE
GROUP

(1868)

PROGRAMMERS
London IBM Cobol/PL1/Mark IV

Tel: Roger Barnes on 01-628 4200
45B Copthall Avenue, EC2R 7DA

SIDA

U-C-A

Programmers with a Future
N/R Walton-on-Thames **To £9000**

You know you're good, now is the chance to prove it! Join one of the world's leading computer manufacturers and make a real name for yourself. All you need is 12 months or more RPG II or COBOL experience to join a professional team developing exciting manufacturing and commercial packages for their very latest on-line computer hardware. Your career is then totally assured and you will enjoy all the benefits of a large financially secure company CW 28/1

Basic Programmers
SE England **£6,000-£9,500**

I bet you never knew how popular you were! We now have over 25 registered vacancies for BASIC and BASIC + programmers. Opportunities exist in the City, SE1, Brentford, Kingston, Pinner and Maidenhead for people with 1½ years' or more experience. Career growth is assured and most offer very attractive perks. CW 28/2

PL/1 Vacancies
London & Home Counties **£5,500 to £11,000**

We have a number of positions ranging from Programmer to Project Leader with both small and large commercial companies. Locations are the CITY, BROMLEY, BRENTFORD, CHATHAM, HIGH WYCOMBE, REDHILL, SLOUGH, ENFIELD, SOUTHALL and COCKFOSTERS. Perks often include mortgage and removal assistance. CW 28/3

Manufacturing Systems Analyst
North Surrey **To £9,500**

Have you a manufacturing or accounting system background? If you have and you would like to know more about TOPICS the IBM manufacturing systems package give us a call. The company using this on-line system as a pilot scheme soon to be installed world wide, are one of the major manufacturers of home entertainments in the world. Your future career is assured so if you have 3 or more years DP background and wish to benefit from large company perks please apply right now. CW 28/4

Sales Support
London, Manchester & Home Counties **To £9,000 + Car**

We have five MINI computer manufacturing companies with offices around the country who require people with the confidence to deal with clients in a pre- and post-sales situation. All vacancies require a programming background on minis and the jobs will provide an exciting and satisfying career. CW 28/5

Systems & Programming Manager
Middlesex **To £11,000**

A major commercial organisation heavily involved in the glamorous film industry wishes to appoint a project leader type. He will take total charge of a small staff involved in various new application areas including Marketing, Finance and International M.I.S. Both IBM and minis are in operation so the right applicant should have supervisory and at least 3 or 4 years' COBOL experience, and can look forward to a first-rate career with this company. CW 28/6

Consultants
Central London **£10,000 to £16,000**

4 large, well-established consultancies wish to recruit systems people with all-round experience on the latest equipment and the right personality to deal with clients who require first-rate service. Technical Communications Consultants are also required where in-depth implementation experience of IBM or DEC latest ranges are essential. Excellent fringe benefits and prospects. CW 28/7

Contract Programmers
To £450 p.w.

NCR	NEAT/3 & COBOL	LONDON	3 MONTHS+
IBM	COBOL & ASS. OS	S. COAST	3 MONTHS+
IBM	PL/1 OS	HAMPSHIRE	3 MONTHS+
IBM	PL/1 & COBOL OS	SURREY	3 MONTHS
IBM	MARK IV	ESSEX	3 MONTHS
HONEYWELL	L64 COBOL	BRUSSELS	6 MONTHS
HONEYWELL	L66 COBOL GCOS	HOLLAND	6 MONTHS
VARIAN	FORTRAN	GERMANY	6 MONTHS
ICL	DATAMAN-DRIVER PLAN	GERMANY	6 MONTHS

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Recruitment Consultants
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Prospect Place, London W4 3BR
(01-958 6136 Evenings)

(1880)

JBA

DEC Sales Executives
Saudi Arabia
c. £20,000 package Tax free + car + accom.

We have been retained by a large commercial organisation, who are the distributors for DEC systems in Saudi Arabia, to recruit Sales Executives to work from their Jeddah offices.
Applicants should have at least five years experience on Digital equipment together with a proven sales record, preferably in technical, government or industrial markets. Management abilities (or potential) could assist in the Companys development. A knowledge of Arabic would obviously be an advantage. **Contact: Jim Baker**

Project Manager
Norway **c. £15,000+ free accommodation plus car**

Our client, one of the most innovative electronics companies in the communications field, wish to recruit a highly skilled professional on a two year assignment in Norway.
The successful candidate, who will be taking charge of a communications development project, should have ten years experience using micro, real-time and communications software techniques.
Ability to manage a large technical team and co-ordinate the various functions of a sophisticated project. **Contact: Brian Postles**

Systems Analysts
City **£10,000**

We are recruiting for one of the leading international banking organisations, who are developing systems for a network of branches, to offer commercial and consumer finance.
In order to be considered for these positions at least 4 years experience in programming, with some design and maintenance using COBOL or BAL, plus exposure to a multi-programming environment, is desirable.
Excellent career prospects will be offered to the successful candidates plus all benefits usually associated with a financial organisation.
Contact: Janet Chilvers

Systems Advisers/Sales Support
North London **£9,500 + car**

A reputable and growing manufacturer in the forefront of the mini computer field requires customer support analyst programmers.
Candidates for these positions will be energetic, versatile and capable of controlling several client accounts at any one time.
Responsibilities will encompass pre/post sales support, customer training conducting demonstrations and benchmark software. The experience required is a thorough understanding of data processing techniques gained through previous successful support of commercial applications, while an appreciation of IBM techniques is mandatory. Fringe benefits include a bonus scheme, BUPA and a car. **Contact: Margaret Stevens**

Development Engineers
Surrey **c. £8,000**

Several positions have been created, due to continued expansion by this software house, to work on a number of mini and micro development projects.
Applicants will be expected to demonstrate a sound track record in micro techniques incorporating design and programming on digital devices.
An excellent opportunity to capitalise on your skills in this fast moving team environment. **Contact: Brian Postles**

Programmers
Berkshire **up to £7,500**

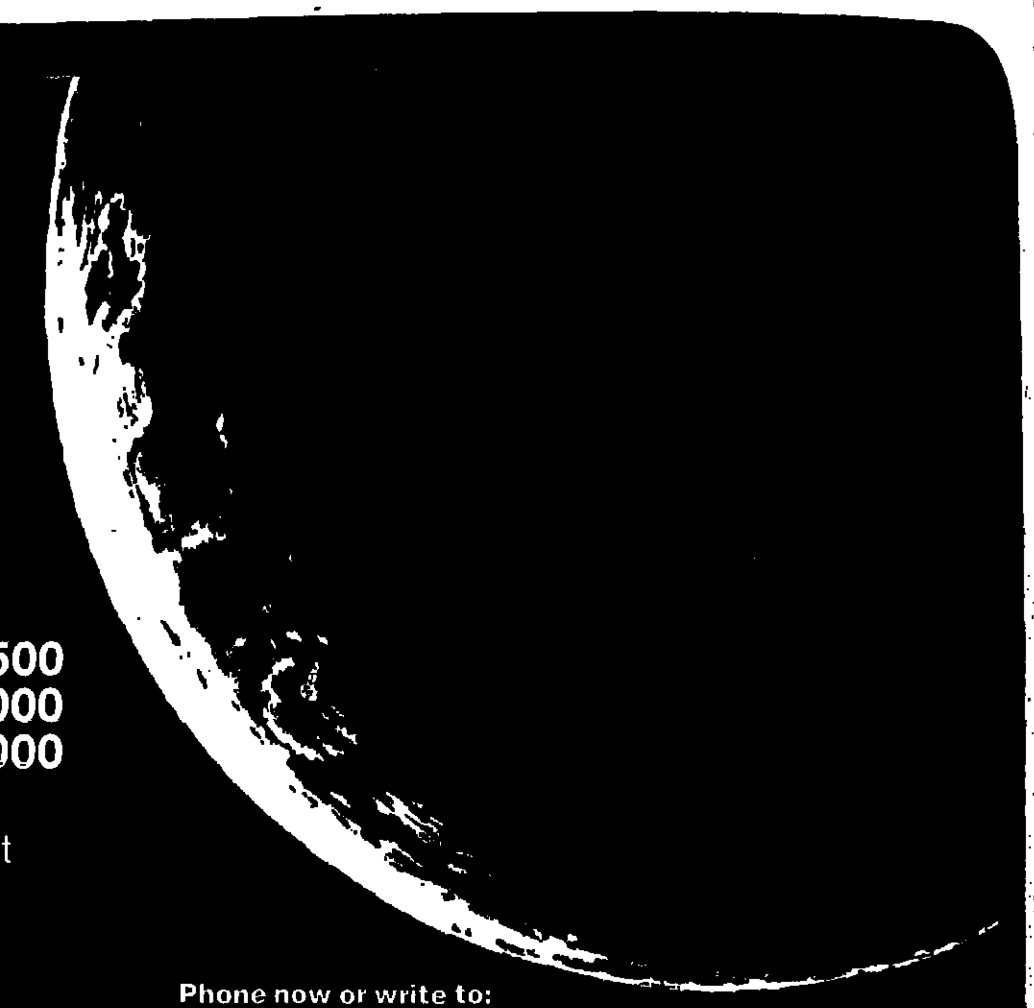
A small, but rapidly expanding, systems house who specialise in real-time projects would like to recruit several programmers to work on the development of new systems. Candidates should have a nominal three years experience in real-time mini or microcomputer development using languages such as FORTRAN, BCPL, etc. A knowledge of small system software (device drivers, operating systems, etc.) would be an advantage.
Since there are several opportunities, staff with more than one years experience would be considered as would juniors. **Contact: Jim Baker**

Basic + Programmers
Middx. **£7,000**

Our client, a major Market Research organisation, are in the process of updating to IBM 4381 and PDP 11/70's.
The company is involved in substantial systems development work, and need experienced people who are able to contribute immediately.
Eighteen months experience of commercial programming in Basic + preferably in a PDP 11 or IBM environment, is desirable, but consideration will be given to high calibre candidates with a minimum of nine months working expelence of a Basic + language. **Contact: Janet Chilvers**

JAMES BAKER ASSOCIATES,
International Personnel Consultants,
32 Savile Row, London W1.
Tel: 01-439 9311.

SATELLITE COMMUNICATIONS in WEST GERMANY



Team Leaders	**up to £18,500**
Senior Analyst Programmers	**up to £17,000**
Programmers	**up to £15,000**

MARCOL's Advanced Systems Division have current opportunities in West Germany for permanent professional staff to work on real-time satellite communications systems.

If you have:–

- ● Real-time background
- ● Mini computer experience
- ● ASSEMBLER
- ● FORTRAN (not essential)

Phone now or write to:
Penny Bailey
Marcol Computer Services Ltd
60 Queen's Gardens, London W2
Tel: 01-402 9355 (24 hour service)

MARCOL
"reaching for the stars

Computing Services Association

DATA PROCESSING MANAGER

SOUTH LONDON/KENT £6400+CAR

The ideal person for this position should have sound RPG II background, together with the ability to supervise a small team. He/She will be fully responsible for the day to day running of the Data Processing department. REF. B4173

OPERATIONS

SHIFT SUPERVISOR

WEST LONDON/MIDDLESEX c. £7000+

Our clients are shortly to install the latest IBM Mainframe and are seeking an experienced Shift Leader with a sound DOS/VS background. The site will operate a two-shift system and among the many attractive benefits offered are FREE MEALS and FIVE WEEKS' PAID HOLIDAY PER YEAR. REF. B4078

SHIFT LEADER

EAST LONDON £7000+

Applicants must have at least two years' experience of DOS/VS POWER experience, together with the ability to supervise. This position would also suit a Senior Operator seeking promotion. The site operates a three-shift system and offers good fringe benefits. REF. B4176

OPERATOR

MIDDLESEX c. £6000

Our clients are a large commercial company based in Middlesex and are seeking an Operator with a minimum of two years' DEC/PDP experience using RSX. This company offers excellent career progression. REF M4132

OPERATOR

NORTH LONDON c. £5500

Our clients, leaders in their own specialised field, wish to recruit two Computer Operators to join their small friendly department. Applicants should have a minimum of eighteen months' experience gained at a 1900 or 2903 site. This position offers excellent fringe benefits. REF. M4102

SYSTEMS

SYSTEMS PROGRAMMER

SURREY c. £9000

A major systems company have asked us for assistance with the recruitment of an experienced Systems Programmer. Applicants should have real-time systems experience using assembler language in conjunction with mini computers and/or micro processors. The successful candidates will work on the design and development of a wide range of top quality software. Some work away from the Surrey base including overseas can be expected. The company offers excellent career prospects to the right applicant. REF M3689

ANALYST/PROGRAMMER

HAMPSHIRE [illegible]

Our clients are seeking someone with at least three years' RPG II or COBOL experience. Applicants must have reached implementation level and be prepared to undertake occasional EUROPEAN TRAVEL. REF. B4176

PROGRAMMERS

SOUTH COAST to £6000

After recent expansion our clients are seeking two further RPG II programmers with a minimum of one years background. Experience of on-line systems will be an added advantage. REF. B4127

PROGRAMMER

SOUTH YORKSHIRE £6500

Our clients, a large manufacturing company are seeking a Programmer with a minimum of eighteen months RPG II experience. Knowledge of CCP would be advantageous. The latest IBM hardware is to be installed later in the year offering excellent opportunities within the department. REF. B4128

PROGRAMMING TEAM LEADER

EAST LONDON to £10,000

We have been asked to assist with the recruitment of a Programming Team Leader for a major insurance company. Applicants for this position must have a minimum of four years' ICL COBOL knowledge. Real time systems development and PLAN and supervisory experience would be an advantage. Our clients offer a very attractive package of benefits which include subsidised mortgage, free lunches and annual bonus. REF. M4141

SYSTEM ENGINEER

CITY OF LONDON £10,000+Mortgage

Applicants must have a minimum of four years' experience of IBM Assembler, together with at least two years' IBM CICS. He/She must be sufficiently familiar with the design to be able to provide a reliable structured system and will be fully responsible for the monitoring of the Real Time system. He/She will be a technical specialist who will design and generate software and carry out some programming. The ability to supervise the work of other programmers is essential. The company offer an excellent salary and many fringe benefits including five weeks' paid holiday a year. REF. B4142

[illegible]

CONTRACT SPOT

DESIGN

CONSULTANT/SENIOR ANALYST. Our clients require an experienced consultant to [illegible] on on-line system for their ICL 2904 installation. Experience of ICL [illegible] together with a knowledge of COBOL and/or RPG is required for this contract in the North East. REF. JW.728

PROGRAMMER. A PDP/11 BASIC programmer is required for this two-month contract in central London. The assignment could well suit a student with 12-18 months' BASIC experience. REF. JW.720

MICRO-PROCESSOR DESIGN PROGRAMMERS. We require programmers for our client's new hardware and software developments. Applicants should have MACHINE CODE or LOW LEVEL LANGUAGE experience, ideally gained on INTEL 80-80 or similar hardware. They should also have experience of software [illegible] and design. The assignment based in the Midlands will be for an initial period of six months. REF. MH.212

TECHNICAL SUPPORT

JCL WRITER. Our client in the Home Counties require an OS/VS1/MVS JCL WRITER with sound experience of VSAM and IMS. The contract will be for a minimum of six months. REF. CM.[illegible]

Complete the coupon and return to Effectia Gravis, National House, 66 Wardour Street, London, W1V 3HP, for your next PERMANENT or CONTRACT job.

(BLOCK CAPITALS PLEASE)

Name (in full) ....

Address (Permanent) ....

....

Telephone: Home .... Office ....

....

Type of Transport .... Date of Birth ....

Current Position ....
(Contract/Permanent) delete

Salary/Rate ....

Position Required ....
(Contract/Permanent) delete

Salary/Rate ....

Notice Required/Date Available (delete) ....

Areas Preferred: First Choice

Second Choice

Experience to date: (Last Position First)

Company: Name From To
and Location Mth/Year Mth/Year Duties and experience

[illegible]

Date Signature

Reg. No.
DATE

JBA

MIDLANDS & NORTH

Control Systems Engineer

S. Yorks **c. £10K**

A leading company is about to embark on a major project to install computerised process control equipment and is seeking a Control Systems Engineer to co-ordinate development, installation and on-going maintenance.

Applicants, aged 28 or over, should be hardware oriented with a significant industrial experience relative to instrumentation and process control using mini or micro computers. Familiarity with appropriate software development techniques would also be advantageous.

Systems Analysts

North West **to £8,000 + Benefits**

Opportunities exist for experienced SYSTEMS people within one of the most advanced installations within the region. The company is highly respected and provides excellent scope for career progression and first class training facilities.

Applicants should have a minimum of 3 years commercial systems experience preferably with a period in a large main frame environment. Though not essential, familiarity with on-line systems would be an advantage.

A secure organisation, good salary package and, where appropriate, generous relocation expenses.

Systems Co-ordinator

North West **c. £8,000**

A major division of a large engineering organisation is seeking a Systems Co-ordinator to define and manage the implementation of manufacturing and administrative systems within their new factory.

Applicants, aged 28-35 years, should have a good education and a computing background involving systems design and development within the engineering industry.

This is an excellent opportunity for a young person to achieve a management position within a dynamic organisation.

Senior Systems Analyst

West Midlands **to £8,000**

A progressive company forming part of a very successful international group is seeking a SENIOR SYSTEMS ANALYST.

Ambitious development plans have been agreed involving accounting, manufacturing and production control systems and it is envisaged that the successful candidate will enjoy complete systems responsibility within an agreed area.

Applicants should have a sound computing background, with some experience in a HONEYWELL environment. A knowledge of IDS and manufacturing systems is particularly relevant to this appointment.

Analyst/Programmer

Midlands **to £8,000**

A really interesting opportunity combining involvement in the development of an advanced new Distributed Processing System and extensive EUROPEAN TRAVEL. The company is multi-national and the project requires a self motivating personality who can work in a multi-discipline hardware environment.

Applicants should have a minimum of 2 years COBOL programming experience preferably gained in an IBM 370 environment. An appreciation of DOS, CICS and DL/1 would be an added advantage.

Programmers – IBM 370

Manchester **Negotiable to £7,000**

A computer services organisation of a large concern with diverse interests in many high technology fields has opportunities for Programmers with variable levels of experience.

Applicants must have a good education and a minimum of 1 years commercial programming using COBOL. Experience of on-line systems related to manufacturing is particularly advantageous.

Programmer

Rugby **Up to £7,000**

A medium sized engineering group has a vacancy for a PROGRAMMER to assist with the development and implementation of manufacturing systems. The company has an up to date approach to computing and over the next 12 months will be implementing systems using on-line, database and telecommunications software.

Applicants should have at least 2 years programming experience using COBOL.

Experience of an IBM 370 environment using DOS or DL/1 is particularly relevant but by no means essential.

A first class opportunity for programming skills to be consolidated with really up to date experience.

Programmer RPG2

Peterborough **c. £6,000**

A world leader in the manufacture of school and office data processing supplies, are seeking an experienced programmer to work in its state of the art computer department. Ideally 2 years good commercial programming experience of RPG2, while a knowledge of IBM S32, S34 and MAAPICS would be a definite advantage. Applications covered include all manufacturing systems and customer services to be used in many European countries.

Excellent prospects will be offered to the successful candidate and would expect to reach a supervisory position in the immediate future.

To apply for the above positions or for further information please contact BEV STEVENS.

JAMES BAKER ASSOCIATES,
International Personnel Consultants,
Gateway House, 50 High Street,
Birmingham B4 7SY Tel: 021-643 7865

PDP 11 UK & HOLLAND

Commercial experience, preferably gained on PDP 11's under RSTS or RSX 11M, using BASIC language sought by UK-based producer of turnkey business systems for their offices in Northern and Southern England, and Holland. Opportunities range from software support and development through to Consultancy

£7-16K

SYSTEMS SOFTWARE

Assembler Programmers required for advanced telecomms system currently being developed in London in parallel with US project. Using Series 1 hardware, you will be involved in initial development work followed by world-wide implementation. Excellent travel opportunities to liaise with US teams

£7-9K

PROCESS CONTROL

Real time Mini (pref PDP 11) or Micro experience for advanced design and development work in Process Control Applications, required by leading Instrumentation and Control Group based in Herts. Ideally 2-4 year's Assembler or CORAL should be offered. Project Leaders also required

£6.5-11K

SALES SUPPORT

18 months plus experience, Assembler on Minis, with knowledge of operating systems for post-sales software support role involving installing operating systems, some customer training, and providing ongoing support. Opportunities will be given for pre-sales involvement. Previous experience in a customer liaison environment is an advantage.

c £8K + car

SAUDI ARABIA

PL/1 and COBOL Programmers (permanent or contract) with 3+ years on large IBM's for assignments of 3 months upwards in Saudi Arabia. Applicants with TP or DB experience of especial interest. Employed by a UK Software House you can expect an outstanding remuneration package, plus excellent prospects in the UK and EEC

to £25K tax free

T.P & Data-Base

Programmers Designers & Consultants

The company: a Multinational Consultancy specialising in database, teleprocessing and communications systems, with European offices in England, Germany and the Netherlands. The company is growing rapidly and to sustain this growth requires additional expertise at many levels.

The opportunities: experience in the fields of Database Design, Network Design, Message/Packet Switching, Data Dictionary or similar is of considerable interest to our clients. In particular the requirement is for Systems Programmers, Programmers and Designers with knowledge of Codasyl Databases and CICS or TPMS, Consultants in the Communications field with experience of X25, Message Switching, etc, and Database Project Managers.

For overseas positions language ability is a distinct advantage. Long term prospects for successful applicants are excellent as the company's policy is for promotion from within. An excellent benefits package accompanies the top salaries offered.

UK to £16K EEC to £20K

(1917)

CHESHIRE

Experience of Production Control Systems sought by specialist department (based in Cheshire) of this major Computer Manufacturer. In-depth knowledge of the application field of Production Control more important than specific hardware background. 5 or more years experience required.

£7-10K

MINIS. MIDDX. & SURREY

Knowledge of Interactive Systems, Interfaces and Interpreters at Analyst/Programmer level especially needed by manufacturer specialising in banking and small business systems. Experience on PDP's, DG, or similar appropriate, Assembler plus at least one high level language preferred.

to £9K

WEST LONDON

Senior Analysts, Team Leaders and Senior Programmers; experience on minis, micros and mainframes gained in a commercial environment required by Systems Development section of leading British Industrial Organisation. Combine interesting development work with the financial stability our clients can offer.

£9-11.5K

HOLLAND

Programmers and Analyst/Programmers with 2-5 years Mini Assembler gained in a scientific or technical environment required by International Systems Group, based in Holland. Applications include Process Control, Simulation, Networks and Message Switching. Permanent positions only, generous relocation assistance offered to successful applicants plus an excellent benefits package.

£12-17K

GERMANY

PDP 11 experience and knowledge of graphics required for recently opened German office of US company specialising in computer systems for the publishing industry. German advantageous but not a prerequisite. Long term prospects excellent as the company will be expanding and diversifying over the next few years.

£12-17K

(1917)

MATRIX

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If the job you're seeking isn't featured call Matrix – if that job exists we'll go to great lengths on your behalf.

MATRIX

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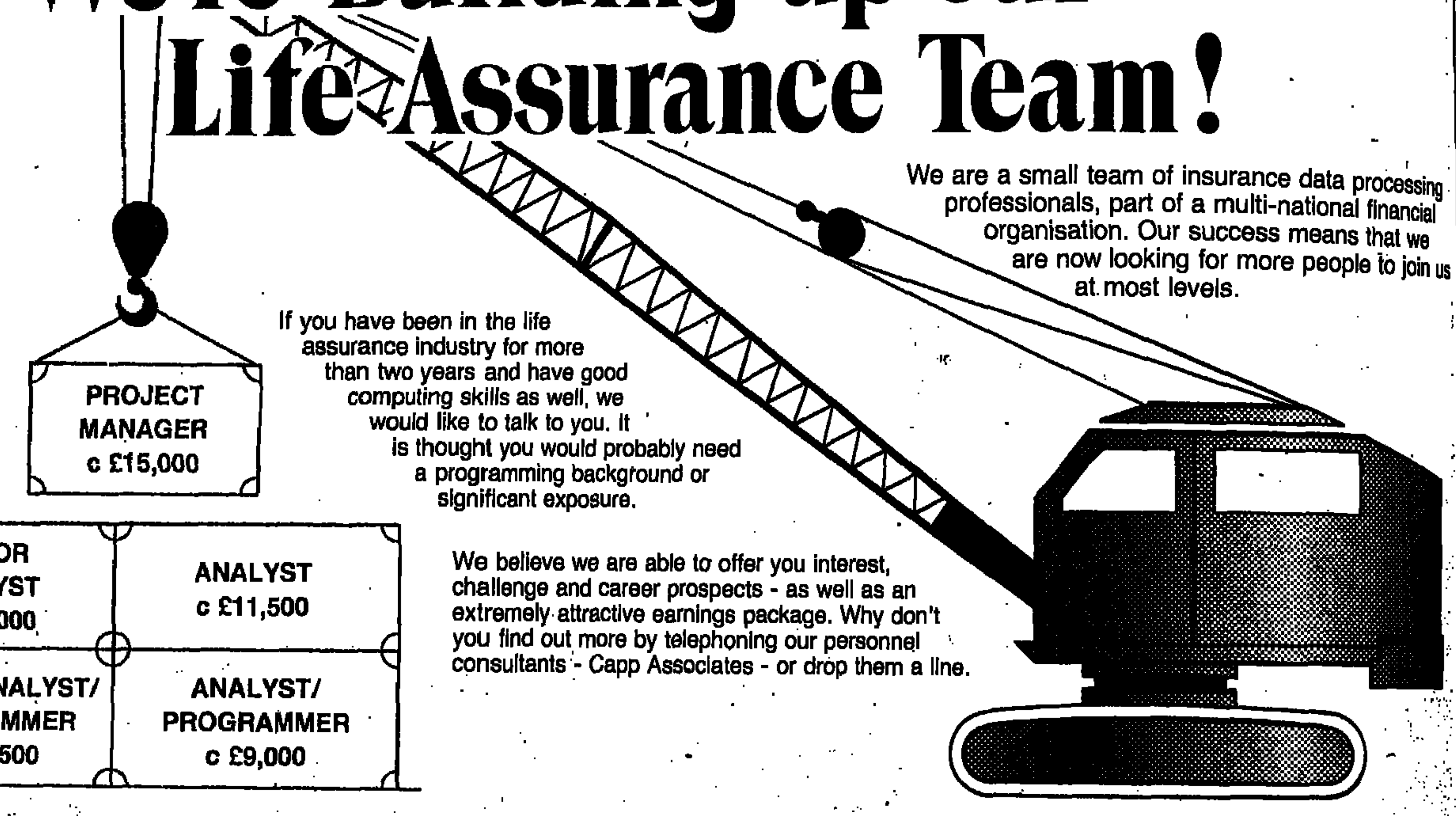

We are a small team of insurance data processing professionals, part of a multi-national financial organisation. Our success means that we are now looking for more people to join us at most levels.

If you have been in the life assurance industry for more than two years and have good computing skills as well, we would like to talk to you. It is thought you would probably need a programming background or significant exposure.

PROJECT MANAGER
c £15,000

SENIOR ANALYST
c £14,000

ANALYST
c £11,500

SENIOR ANALYST/PROGRAMMER
c £11,500

ANALYST/PROGRAMMER
c £9,000

We believe we are able to offer you interest, challenge and career prospects - as well as an extremely attractive earnings package. Why don't you find out more by telephoning our personnel consultants - Capp Associates - or drop them a line.

Please telephone (24 hour answer service) or write to apply. Quote Ref: CW138-H,

CAPP ASSOCIATES
01·686 9693

Computer and Professional Personnel Consultants
AMP House, Dingwall Road, CROYDON CR9 2XA

MYRIAD

INTERNATIONAL COMMUNICATIONS SOFTWARE

WINDSOR **START UP TO £10,000**

We are seeking an ANALYST/PROGRAMMER with experience of programming DATA GENERAL mini-computers to accept the challenge of developing software for an entirely new international data communications system. This is for use within major financial networks covering Europe, the U.S.A. and the Far East.

To command a top salary, which is supplemented by a regular bonus, you should be able to offer a number of years programming experience which will include two years on DG with DGL or Assembler under RDOS or RTOS. Ideally you should also have written communications and device level I/O software.

Once the initial system has been completed opportunities exist for travel to the U.S. for implementation and you will find that working within a small, expert team will enable you to develop your software talents to the full.

The Company offers an excellent package which includes four weeks' annual leave (rising to six weeks), two bonuses each year and a commencing salary up to £10,000.

REF: SW171007/CW

MYRIAD APPOINTMENTS LIMITED
30 Fleet St. London EC4Y 1AA Tel. 01-353 0981 24 hrs

UNIVERSITY OF LEEDS COMPUTING SERVICE

Leeds University is the largest single Campus University in the country. Computing Service provides facilities for both research and teaching to the whole University. Current hardware includes a 6MB Amdahl V/7A and a 2Mb Prime 750 supporting a large terminal network.

Applications are invited for the following posts.

Programmer—

1 vacancy to work in Language Systems

Operator—

2 vacancies.

Candidates for the Operator Post should have a thorough knowledge of operating VM/CMS as it is intended to make an appointment at Senior Level. Day, evening and weekend shift working is required.

Salary, Programmer — £3270 to £4560. Operator — 1 post on the scale £4062 to £4740 and one post on the scale £4398 to £5412, both plus 21% shift allowance.

All scales currently under review.

For further particulars and an application form write to the Secretary, University Computing Service, The University, Leeds LS2 9JT, or telephone (0532) 31751 ext 6303. (1912)

UMIST
LECTURER IN SYSTEMS ANALYSIS

REF. COM. (116/80. The Department of Computation is an expanding department with one of the largest Honours Schools in the country. The graduate output is highly sought after by industry. The Department has access to excellent computing facilities, including its own micro and mini computers, and to the Regional Computer Centre's large ICL and CDC machines (CDC 7600 and CYBER 72).

A vacancy exists for a Lecturer in Systems Analysis and Data Processing. Applicants should have had previous professional experience in an applications environment; previous teaching experience is not essential.

Salary will be on the scale £6052 – £10484 per annum.

Requests for application forms and further particulars, quoting the above reference should be addressed to the Registrar, [illegible] UMIST, PO Box 88, Manchester M60 1QD. The closing date is [illegible] 1980. [illegible]

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Bechtel, a world leader in engineering and construction, are assisting the Royal Commission with the construction of the Jubail Industrial City in Saudi Arabia. The project is developing rapidly and this means we are now looking for additional D.P. personnel to play their part in its future development.

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Applicants with at least 5 years experience of systems analysis should have completed at least one major project from feasibility through to implementation.

COBOL PROGRAMMERS
SYSTEMS ANALYSTS
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Two Programmers and a Systems Analyst are required by an international organisation for maintaining existing applications and development work.

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Several companies in the above areas are seeking experienced people for their analysis and programming positions. Salaries offered are in the region of £7,000-£8,000.

If you wish to apply for any of the above vacancies, please send us your full CV or phone for an Application Form.

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ANALYST/PROGRAMMER

A PLANNED FUTURE WITH OXY ENSURES THE CONTINUATION OF A FINE CAREER.

Aberdeen is Oxy's offshore headquarters and it is here that our small and highly motivated Data Processing Department is based. The company's considerable growth and planned expansion stretching as far ahead as the year 2,000 is reflected in the DP function where we now intend to recruit an additional analyst/programmer who will specialise in business systems development.

All systems being developed are state of the art, VDU based applications, with primary emphasis on control of critical materials supply requirements, for Oxy's North Sea Operation. Future plans include adoption of distributed processing technology and expansion of operational interactive processing functions to Oxy's international network.

RESPONSIBILITIES

As an integral part of a small team, you will play a major role in initiating and implementing business systems in liaison with the appropriate user departments. This role can begin with program development and implementation and, with more experience, include a leadership position in the feasibility study and detail design of interactive, data base systems.

QUALIFICATIONS AND EXPERIENCE

This position is just right for an ambitious young person who wants to be more than just a number. You will have a minimum of two years experience in business systems programming. A thorough knowledge of COBOL is essential. Experience with medium to large scale IBM equipment, IMS or CICS-DL1, and materials management or financial systems is desirable.

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Occidental is one of the most successful companies in the history of North Sea Oil. We have achieved our success through employing top expertise at all levels. To employ these people our rewards package has to be good.

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Occidental Petroleum
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OXY PROFIT FROM OUR PROGRESS

(1927)

Operations Supervisor Computer Services
Barnard Castle, Co. Durham

We are responsible for the UK manufacture of Glaxo Pharmaceuticals and their sale in this country. We operate a network of HP3000 Series III and Model 33 mini computer using the MPE III interactive operating system and DS3000 for remote communications. The network revolves around our Company Headquarters at Greenford (West London) linking with a further 5 sites. One of these sites, Barnard Castle, has a vacancy for an Operations Supervisor.

Key tasks will be to:

- *provide technical support for the real-time system in use*
- *schedule the data preparation activities*
- *be involved in the day-to-day running of batch systems*
- *implement operating system/configuration updates on the HP3000 series III.*

There could also be an opportunity for the successful candidate to train to undertake programming.

Promotion prospects are good, and Group-wide. Major company benefits include non-contributory pension scheme and participation in Group profitability.

Barnard Castle is a small market town situated in the pleasant rural area of Teesdale, yet having easy access to Darlington, York, Leeds, Newcastle, the Yorkshire Dales and the Lake District.

For an application form candidates, male or female, should write to: Mr. A. Winn, Deputy Personnel Manager, Glaxo Operations UK Ltd., Harmire Road, Barnard Castle, Co. Durham, quoting ref. FY.119.

GLAXO OPERATIONS

THE SALES BIT

Professional integrity is priceless

A COUPLE of recent experiences have reminded me how precious and fragile a thing is professional integrity.

In one instance I was told by a salesman that 10 months after being placed in a job by a well-known recruitment agency, the consultant who had actually found the position for him had contacted him in an attempt to persuade him to leave and join another company. The consultant was completely undeterred by the fact that his company had been paid a very significant fee by the salesman's current employer for locating him in the first place and apparently oblivious of the ethical implications of his action.

The salesman's reactions were, I am very pleased to say, both positive and commendable. He told the consultant to push off and declared he would never use that agency again (despite the fact that he had become unhappy in his job and was actually seeking a change of employer!).

In the other case a salesman who had been in his job for four days was approached by a recruitment consultant, who was fully aware of his very recent appointment yet tried to persuade him to leave and take some other job with one of his company's clients rather than continue in the current job which had been found by a competitive agency. As you might expect, his reaction was identical to the former example.

The lesson to be learned from these sorry stories is the need constantly to be aware of the nature of professional credibility: how very long it takes to create it, how it can only be built upon integrity, how fragile a commodity it is, how simply and quickly it can be destroyed and how its resurrection is virtually impossible.

In both these examples I am sure the agencies concerned are highly professional and ethical organisations, for I cannot imagine that any reputable company would condone either of the cases I have described. Furthermore, I would heartily recommend that any person or company avoid such organisations if ever they are exposed to, or even hear about them. The Computer Services Association has an excellent formal code of conduct for recruitment agencies and I can assure you that such practices as I have described are expressly barred.

The point is that only one individual, on one occasion, needs to take an unprofessional, unethical or even dubious action, and in no time at all the whole organisation is tarred with the same brush. In the cases described, the salesmen stated to me that the ABC and the XYZ recruitment companies are cowboys, charlatans, unethical opportunists, a disgrace to the profession, and so on. If they are telling me that, then they are saying the same elsewhere — and so the word gets around.

From the related company point of view it is completely untrue, unfair, unjustified and very damaging; but once the seed is planted it often makes it all the way to a very bitter harvest.

These examples are in no way exclusive to the recruitment business. Every day within all kinds of job functions, individuals are putting company integrity at risk. The production department that knowingly creates goods which are out of tolerance; the despatch department that deliberately tops up a delivery with a bit of old stock; the transport department that makes a delivery promise it cannot keep — may be joined by the salesman who can commit all manner of unethical acts, sometimes without even realising it.

How about: claiming to have a product facility that does not exist; quoting an irrelevant reference sell; giving an unnecessary discount; offering to share personal commission with the buyer; offering material personal incentives to the buyer; making derogatory statements about competitors; claiming applications experience that does not exist; promising non-existent production capacity; fiddling expenses; failing to come back with information promised during a sales call; persuading the employee of a potential client to fabricate complaints about existing competitive products. The list is virtually endless.

All it takes is one deliberate or even accidental slip and you're dead — in professional terms. It never really pays to take risks when it comes to business integrity. There are enough ethical pitfalls to contend with in one's social life, without digging a few more during the working day. Don't tell me you've never coveted your neighbour's ox.

TRADER

Expansion move

TO cope with expanding business Rapid Recall has moved its headquarters to Rapid House, Denmark Street, High Wycombe, Bucks HP11 2ER. Telephone numbers are: Sales 0494 35834, and Applications 0494 26271. The service department remains at 6 Soho Mills, Wooburn Industrial Park, Wooburn Green, Bucks. Tel 06285 24961.

Puzzle Answer

If F equals feet ordered, and I inches ordered, the basic equation is

$$\frac{3(12F+I)}{10} = 12I + F$$

or $36F + 3I = 120I + 10F$ or $26F = 117I$ or $2F = 9I$. But both F and I must be less than 12, so the answer is: 9ft 2in ordered, 2ft 9in delivered.

JOIN THE ELITE

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You are selling/marketing with one of the major manufacturers and are ready for your next move to this outstanding WP/DP company acknowledged for its state-of-the-art technology and aggressive marketing strategy. Unparalleled benefits package includes high guarantee and open-ended commission structure. Contact Rosemary Forsyth, Sales and Marketing Division

COMMERCIAL MINICOMPUTER SALES EXECUTIVE c £23,000 + choice of car

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Help launch this exciting new Banking Hardware Package in the U.K. Market.

Ideally you have experience within a major computer company, with a bias towards network installation, and knowledge of retail banking or Building Society systems.

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HODGE RECRUITMENT
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(1803)

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(1788)

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SDA

APL STUDENT PROGRAMMER

Contact IATA GENEVA
Tel. 983366 ext. 307 or London 839 1682

UNIVERSITY OF EAST ANGLIA
Norwich

Applications are invited for the newly established post of

LECTURER IN COMPUTING STUDIES

in the School of Computing Studies and Accountancy. Preference will be given to candidates having appropriate experience and research interests in the broad area of data processing, systems analysis and information systems. However, applicants with interests in any area of non-numerical computing will be considered. The appointment will commence on 1 October 1980 or as soon as possible thereafter. The initial salary will be at an appropriate point on the Lecturer scale, currently £6052 to £10,484 (under review) plus USS benefits.

Applications (one copy only) giving full particulars of age, qualifications and experience, together with the names and addresses of three persons to whom reference may be made, should be lodged with the Establishment Officer, University of East Anglia, Norwich NR4 7TJ (telephone 0603 56161 ext 2126) from whom further particulars may be obtained, not later than 18th July, 1980. No forms of application are issued. In naming three referees you are particularly requested to give only the names of those who can immediately be approached.

(1692)

UMIST
ANALYST/PROGRAMMER

REF: ME/120/BC. An Engineering Analyst/Programmer is required to assist staff and research students in the Manufacturing and Machine Tools Division of the Department of Mechanical Engineering. The work will include systems analysis, programming and documentation of software for a variety of applications in the developing field of Computer Aided Design and manufacture. The computing facilities range from micros to mini-computers and the SRC Interactive Computing System, in addition to the CDC 7600 at the UMRCC. An engineering background would be an advantage, but experience in a professional programming environment and the ability to establish documentation disciplines and standards is essential. FORTRAN is currently the major language in use but a knowledge of BASIC and/or assembly language would be an asset.

Salary will be on the scale £6052-£8769 per annum.

Requests for application forms and further particulars, quoting the above reference, should be addressed to the Registrar, Room 86, UMIST, PO Box 88, Manchester M60 1QD. The closing date is the 28 July, 1980.

(1950)

UNIVERSITY COLLEGE CARDIFF

ASSISTANT COMPUTER OFFICER

Applications are invited for the post of Assistant Computer Officer in the User Services Group at the Computing Centre, primarily to assist in providing an Advisory Service to computer users. Periodic supervision of a faculty computing area, which includes a remote job entry station. Knowledge of Fortran is required and experience of Algol and/or Basic is desirable, a degree qualification is not essential. This is a fixed term appointment, tenable for a maximum of three years, within the salary range £4404-£6063 under review. Duties to commence as soon as possible.

Applications, together with the names and addresses of two referees, should be forwarded to the Vice-Principal (Administration) and Registrar, University College, PO Box 78, Cardiff CF1 1XL, from whom further particulars and application forms are available. Closing date 31st July, 1980. Reference [illegible].

(1662)

SENIOR COMPUTER OPERATOR

With two years' experience of ICL 1906A, including communications, working on three-shift system.

Salary scale £3,558-£4,362 p.a. plus shift allowance of £750 p.a.

Application form from:
Assistant Secretary,
Personnel Office,
University of Birmingham,
P.O. Box 363,
[illegible]

Targa

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Vacancy exists for good Prime operator with six months' plus experience for City site.

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Senior OPS and OPS vacancies at BERKS./BEDS. sites. 1-2 years' experience required.

HONEYWELL GCOS + OS2000 c. £6,500

Senior OP and OP required for Hampshire Co., 1-3 years' experience required. Excellent prospects for right people.

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SURREY	ANAL/PROG	6 mths.	HP3000	£6,000+
ESSEX	DP MGR.	SYS 64	RPG11	£NEG
LONDON	PROG	2 yrs.	NEAT 3	£NEG.
LONDON/ESSEX	PROG/ANAL	2 yrs.	ICL	£NEG.
LONDON	PROG	3 yrs.	BURR	c£9,000
ESSEX	ANAL	2 yrs.	UNIVAC	c£7,500

TARGA COMPUTER SERVICES
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C&CA
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To become responsible for the maintenance of an existing Data Base system and the future programming of enhancements such as a training course reservation system and publication sales. You will look after one and, later, possibly two programmers who will work from your specifications. You will have to be COBOL fluent, and it would be a plus if you have had experience of managing a small project team and/or are familiar with the HP 3000 and IMAGE/QUERY.

Programmers. (2)

If you are COBOL competent you will be assigned to producing programs from written specifications. After about two years you should be able to work up to an analyst/programmer role.

With FORTRAN ability as a minimum you will be concerned with producing programs to meet the needs of research workers in scientific disciplines. From this you could progress to an analyst/programmer appointment.

Computer Operations Assistant.

A young person of 18-25 will do varied computer operating and V.D.U. work. Previous computer or keyboard experience is a prerequisite.

Employment is at our pleasant country estate located between Slough and Fulmer with transport available from Slough and Uxbridge stations. Initial salaries are negotiated to be commensurate with the ability and experience offered and are progressive with reviews twice a year. All appointments are permanent and pensionable. Application forms may be obtained from:

Personnel Department,
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Wexham Springs, Slough SL3 6PL.
Tel: Fulmer 2727.

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Do you have sound Systems Analysis Experience and knowledge of COBOL? Are you interested in teaching at post-experience level, degree level and above? Would you like to develop research or consultancy in the application of database to the problems of small businesses? Have specific interests in the educational developments of computing?

Then write for an application form and further particulars to:

The Personnel Officer
PAISLEY COLLEGE OF TECHNOLOGY
High Street
Paisley PA1 2BE

(1819)

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CONS. REF. CR 206

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Bournemouth and Poole College of Further Education

Graduates or other appropriately qualified staff are invited to apply for the following post which becomes available within the Department of Science, Mathematics and Computing on 1.9.80.

SENIOR LECTURER IN MICROCOMPUTER APPLICATIONS to concentrate particularly on applications to Business Systems and Computer Aided Learning. (Post 873020). Salary £7,092-£8,280 (bar) £8,871. Further details and application forms from Principal's Secretary, North Road, Poole (Tel. 0202 747600).

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Belgium £20,000+p.a.

We are seeking a Senior Programmer or Analyst/Programmer to work in Belgium on the development of an integrated delivery, scheduling and control system. The work will include some supervision of the 5 programmers working on the project and will also involve development of the more important programs. Applicants should have previous experience of developing IMS DB/DC systems preferably in a manufacturing or distributive environment. The system will be programmed in PL/1 and experience of MVS and TSO/SPF would be helpful. The project will start in early September, and is due to be implemented in the spring of 1981.

For further details, please telephone or write to Jim Shaw at our UK offices, or call during evenings/weekends on 0990 24546.

(1936)

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HONEYWELL 66 **Programmer/Analysts**	**London**
PL1/TOTAL/CICS **Programmers**	**Europe**
COBOL-IBM **Programmer/Analysts**	**Essex, London**

For more information telephone

Alan King
TANGENT COMPUTER SERVICES
1 Eastern Road
Romford, Essex
Tel: Romford 44181/2 28238

(1948)

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SOUTH WEST UNIVERSITIES
REGIONAL COMPUTER CENTRE
University of Bath

ADVANCED NETWORKING

SWURCC needs System Programmers to join a team developing one of Europe's most advanced computer networks. These posts combine a unique opportunity to acquire extensive experience in modern networking, using ICL 2900, Honeywell Multics, DEC VAX, or GEC 4000 hardware, with the opportunity to live in the peaceful countryside around Bath and Bristol.

Ideally applicants will have operating systems (preferably VME/B) or networking experience, but recent graduates lacking this experience are encouraged to apply.

Salaries will be on the scale £5,062-£8,769 (under review). The posts are for 3 years initially.

For a detailed description of the posts, and of SWURCC, contact the Personnel Officer, University of Bath BA2 7AY (0225-61244 Extension 700) quoting reference 80/8R. Closing date 28.7.80.

(1918)

UNIVERSITY OF BIRMINGHAM
DEPARTMENT OF CIVIL ENGINEERING

COMPUTER OFFICER

Applications invited for this post. Candidates expected to initiate development of departmental mini-computer system based on a PDP11 and associated microprocessors. Experience of working with larger machines, e.g. ICL 1906A and/or DEC 2050, an advantage.

Post tenable immediately, starting date to be arranged. Salary according to age, qualifications and experience, on the Computer Officer 1 (Grade 1B) scale £4,402-£7,410 (under review) plus superannuation.

Further particulars from Assistant Registrar (Sci. and Eng.), P.O. Box 363, Birmingham B15 2TT to whom applications (3 copies), including curriculum vitae and naming three referees, should be sent by Friday, 1 August, 1980.

Please quote Ref. CW09.

SOUTH-EAST MIDLANDS

£Negotiable	SYSTEMS ANALYST	COVENTRY	EM828	At least 2 years analysis experience. Commercial background
C.£6,500	PROGRAMMER	COVENTRY	EM830	2 years COBOL experience. Database, on-line experience an advantage
C.£8,000	SENIOR PROGRAMMER	COVENTRY	EM821	4 years' IBM COBOL programming experience. Commercial applications. Some supervisory experience
C.£8,500	SENIOR SYSTEMS ANALYST	COVENTRY	EM822	5 years analysis experience, preferably IBM. Supervisory experience an advantage
C.£6,500	SYSTEMS ANALYST	N/HAMPTON	EM813	1-2 years analysis experience. Financial background. Ability to communicate
C.£7,000	PROGRAMMER	SOUTH WARKS	EM814	2 years' IBM COBOL programming experience. Interested in becoming involved in system software. Manufacturing environment
To £8,000	SYSTEMS PROGRAMMER	PETERBORO	EM827	1-2 years' systems programming experience. IBM DOS/VS. Commercial environment.

Consultant: Margaret Brace.

NORTH-EAST MIDLANDS

£7/8k	SYSTEMS ANALYST	SHEFFIELD	C403	4 years' experience of Honeywell 64/60. To work on interactive systems including Raw Material Stock Control
To £8k	SYSTEMS ANALYST	LEICESTER	C404	At least 18 months' experience in manufacturing environment with production control applications. IBM 370 to 8100 series
Up to £9k	PROGRAMMER	NOTTINGHAM	C436	3 years COBOL programming experience and experience in developing major systems
£Negotiable	PROGRAMMER	LEICS	C444	2/3 years' COBOL programming ideally on ICL hardware. Bureau environment
C.£7,500	SYSTEMS ANALYST	LEICS	C445	Minimum 1 year's systems analysis and design coupled with programming. Financial environment.
£8k to £10k + car	SYSTEMS ANALYST	LEICS	C447	Experience of Production Control Applications. For support role. Bureau environment
C.£7,500	PROJECT TEAM LEADER	LEICS	C448	Ideally 4/5 years of RPGII programming coupled with supervisory experience. Bureau environment

Consultant: Roger Carr.

MIDLANDS & NORTH-WEST

To £7,000	SYSTEMS ANALYSTS	CHESHIRE	B913	Experienced analysts with commercial applications background and preferably programming experience
To £9,000 + rel.	SYSTEMS PROGRAMMERS	N STAFFS	B927	Communications systems design or other systems design experience for software orientated new products division of computer manufacturer.
To £6,500+	PROGRAMMERS	STOURBRIDGE	B931	Skilled programmers required preferably with experience of IBM small systems — RPGII, Assembler, EDX or other.
To £7,000	PROGRAMMERS	W. MIDLANDS	B928	Extremely wide range of business applications, batch, real-time, on-line. PL1 and/or COBOL experience.
To £8,000	SYSTEMS ANALYST	WEDNESBURY	B926	Experienced systems analyst for the development of a range of commercial applications.
£6,000	PROGRAMMER	WEST BROM	B921	Minimum 2 years' IBM COBOL experience. Database and Real Time experience advantageous
£7,000+	SYSTEMS ANALYST	SMETHWICK	B918	Broad based systems experience with a programming background for on-line manufacturing and commercial applications.

Consultant: Peter Bowen.

BIRMINGHAM & BERKSHIRE

£6,000+	PROGRAMMERS	BIRMINGHAM	5/641	Commercial Bureau environment, good COBOL experience required. Mini computers. Good educational background.
£6,000	PROGRAMMERS	BERKSHIRE	5/640	18 months' COBOL. On Line systems. Commercial applications. Project work. Honeywell Hardware. Experience counts.
£6,000	PROGRAMMER	BIRMINGHAM	5/638	Good educational background required with 2+ years' RPG II programming on commercial applications.
£5,000 + commission + car	SALESMEN	BIRMINGHAM	5/636	Bureau sales staff. Applications experience, business systems knowledge essential. Accounting/Production Control and Stock Control packages.
£5,000-£6,000	PROGRAMMERS	BIRMINGHAM	5/635	1-2 years' COBOL experience. ICL hardware. Financial applications. Large company benefits.
£9,000	PROJECT MANAGER	BIRMINGHAM	5/634	Experience of New Systems Implementation and man-management skills. On Line systems/Database would be advantageous. Relocation expenses.
To £7,000	PROGRAMMER	BIRMINGHAM	5/631	2 years+ Assembler experience to work for a Bureau using mainframes and minis. Consultant: Christine Pountney.

MIDLANDS & WEST COUNTRY

C.£5,000 incl. S/A	OPERATOR	SOMERSET	W280	18+ months on Burroughs equipment.
£Negotiable	PROGRAMMER	GLOS.	W275	Approximately 18 months' experience, preferably on ICL equipment, COBOL or FILETAB.
£Negotiable	PROGRAMMERS	SOMERSET	W273	Age 20 to 30. 2/3 years' COBOL experience. ICL installation.
£Negotiable	PROGRAMMERS	WORCS	W271	At least 1 year's COBOL experience. Working in a small team. Software House.
Up to £8,000	SENIOR SYSTEMS ANALYST	WALSALL	W263	Minimum 3 years' experience, preferably some mini experience.
Up to £4,500	OPERATOR	BRISTOL	W262	Between 1-2 years' IBM experience: DOS/VS OS/VS. Shifts, 5-day week, Bureau environment.
C.£6,000	PROGRAMMER	BROADWAY	W282	RPG II preferably but not essential. 1/2 years' commercial experience on any mainframe.

Consultant: Hazel Foggin.

Interviews any time between 9 a.m.-5.30 p.m. evenings and weekends by appointment. Reverse charge calls accepted. Write — Blackwood Associates, Freepost, Birmingham B2 4BR.

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